TIME AND THE NERVOUS SYSTEM

THE BRAIN AS A CLOCK

Disorders of the Clocks: an Outline with Comments *

WILLIAM GOODDY
M.D. Lond., F.R.C.P.

PHYSICIAN TO THE NATIONAL HOSPITAL, QUEEN SQUARE, AND TO UNIVERSITY COLLEGE HOSPITAL, LONDON, W.C.1; CONSULTING NEUROLOGIST TO THE ROYAL NAVY

"It is not possible to obtain a reasonable definition of time with the aid of clocks which are arranged at rest with respect to the body of reference."—ALBERT EINSTEIN: *Relativity*; p. 81.

IN the history of the medical sciences there have been several separate periods, each of a few years, of interest in the time-sense.† In each period, activity seems soon to have declined, perhaps because of the lack of success in experiment and also (when "basic" research was less fashionable and well supported) because practical results were not forthcoming. At the turn of the century a number of papers appeared, and about 1920 another set of works. Lewis (1932), in a paper on the experience of time in mental disorder, was able to comment that "one can still comfortably read through all the available literature, written by a handful of German and French psychiatrists". In 1936, Hoagland published a paper of remarkable originality, about the alpha-rhythm shift of the electroencephalogram during the high-fever treatment of patients with neurosyphilis. In the same year appeared Lecomte du Noüy's *Biological Time*, another work of the greatest originality and importance. A proper appreciation of such works as these is still lacking. Fortunately, Hoagland (1951) made a reaffirmation of his ideas, against a neuropsychiatric background, in a paper entitled "Consciousness and the Chemistry of Time".

Adey et al. (1954) showed the importance of temporal dispersion in cortical afferent volleys as a factor in perception. Riese (1950) observes that the "functional topography of the excitable cortex has to be expressed not only in terms of space, but also in terms of *time*". Another aspect of the same idea was expressed by Gooddy (1957).

Widespread interest in the study of the literature, such an obvious subject for neurological research, is already evident in the field of biology.‡ Harker (1958), in England, and Webb and Brown (1959), in America, have provided very comprehensive reviews of biological rhythms.

The term "animal clock" is often used in biological literature. Such usage is liable to the criticism that an essential feature of any clock-form is its appreciation by an observer (Woodger, personal communication, Gooddy 1958). Tunisian woodlice and scorpions (Cloudesley-Thompson 1956) and the decapitated cockroach (Harker 1958) may serve as clocks for the biologist but not for themselves, in all probability. The term "biological clock" is preferable in that it implies the observations of the biologist.

Clinical Features of the Time-sense

Government Time and Personal Time

Government time (G.T.) and personal time (P.T.), though often regarded as identical, are entirely different and separate entities. Confusion frequently arises when the distinction between G.T. and P.T. is not made, as in such questions as "Does time really go faster (or slower) in thyrotoxicosis or depression?" G.T. is equivalent to clock-on-the-wall time, and to radio time signals. It is a direct expression, in simplified form, of astronomical observations. P.T. is an infinitely variable *average* from the multitudinous physiological clock-systems already outlined. Acceptance of G.T. is implicit in all forms of modern social intercourse, so that there may be an easy adjustment to a common standard. But personal time is always individual and private. Subconsciously we show that we have our private estimations of the variability of P.T.; for it remains a matter of surprise and gratification when a person finds that he can exactly adjust his P.T. so that he is able to wake at a previously specified moment of G.T.

The very word "disease" signifies that the normal smooth (that is, regular) course of existence has been altered. Any disease of which the patient is aware, or which disables him from his full normal activity, to some extent alters his personal time-sense.

In overactive states, as under the influence of general brain stimulants, such as fever, anxiety, thyrotoxicosis, caffeine, or amphetamine, personal time should be faster in relation to government time, because greater activity ("getting things done"), or getting more things done than usual in a period of G.T., gives rise to feeling that there was more G.T. available. Therefore:

P.T. faster is equivalent to G.T. slower.

Even if the stimulant factor is mainly peripheral, as in thyrotoxicosis, with increase in the rate and output of the heart, sweating, and diarrhœa, the patient's peripheral contributory clocks, especially the heart and bowel, will report at an increased rate—that is, more frequently than at the normal, standard, or habitual rate. For example, therefore:

More heart-beats: more personal time: G.T. slower.

The government clock is again slow. (Certainly, the more heart-beats, the more ill the patient; and *the shorter his life*.)

A colleague has supplied an illustration of one of these forms of alteration of the personal time-sense:

"I go to a certain hospital for a clinic two mornings a week. I often go by cab, especially if I am a bit behindhand. The cabs usually take the same route each time, passing certain traffic lights. When I am late, and therefore a bit fussed, (I hate being late) I swear that the red lights stay red much longer than when I am not in a hurry. When I am in good time, the red light stays on the ordinary length of time; but when I am behind time and a bit agitated it stays on for an amazingly long while."

In underactive states, as during sedation, depression, in hypopituitarism, myxœdema, hibernation (when the patient is objectively slowed down), his personally

* This paper is a sequel to one published last year (Gooddy 1958) in which it was suggested that the discoveries and instruments of science are particular examples of mechanisms already perfected in living creatures, and that it is possible to demonstrate physiological clock forms.

† The reader who wants to survey these periods and their works can refer to the catalogue of the Surgeon General's Library of the U.S.A., in the second and third series (this Library is now known as the National Library of Medicine of America).

‡ A symposium on Animal Clocks was held by the Zoological Section of the British Association for the Advancement of Science, at the meeting in York last September.

reporting systems signal less frequently than when he is well. Less is achieved by the patient, so that G.T. is faster. Therefore:

P.T. slower is equivalent to G.T. faster.

In sudden changes of P.T. (as, for example, in head injury, epilepsy, paroxysmal tachycardia, acute emotions), the alteration of P.T. may be obvious. If the cause is a cerebral one, the patient may say " Time seemed to stand still ", or even " Everything seemed to have happened before ". If the change is a local-organ one, the patient will refer the feeling to the local clock-system: " my heart seemed to stand still for a moment, and then raced away ".

In gradually increasing alterations of P.T. from disease or drugs, the patient may not notice any change during the period of abnormality. Only when he is well (normal) again may he be able to make a judgment by comparison, employing his memory. The description that P.T. *seems* slower or faster is inaccurate. At any moment, P.T. is P.T. absolutely. *This is the reason for feeling that G.T. varies.*

We are trained as we grow up so that, in health, we compensate for the alteration in P.T. which may be caused by, say, increased heart-rate, due to emotion or exertion, so that we adjust to G.T. We manage to do this by our awareness of the proportional significance (comparison with clocks unaffected) of the increased rate through the sensory apparatus of the internal organs; and also by multiple references to external clock-systems (chiefly public clocks and personal watches).

Without G.T. or other *external* forms of clock-like activity as a frame of reference, we have no obvious means of detecting when our P.T. is changed. Often in disease there will be no great change between P.T. (habitual) and P.T. (disease), as compared with G.T. Even in severe illness the action of the unaffected personal clock-systems may serve to decrease the difference (temporal homœostasis). But when illness is overwhelming, then P.T. disintegrates; though G.T. inflexibly continues—" He died in coma at nine twenty-five ".

G.T. may be impressed upon P.T. for special occasions of, say, national importance (11 a.m., Nov. 11; and July 4). By such means an emotional, memory-arousal process is artificially produced in a mass of population. These " commemorations ", derived from manipulation of G.T. and P.T., provoke a herd reaction, in which all the personal times of the group are voluntarily " dedicated " to consideration of an important period in the racial time-sense. They are very remarkable phenomena.

Changes or Disorders of the Personal Time-sense

Changes or disorders in personal time-sense can be divided into physiological and pathological groups.

Physiological changes include those associated with waking states (attention, concentration, contemplation), sleep, dreams, the effects of age, and affective states (pleasure, discomfort and pain, boredom, fear).

Pathological disorders may be the outcome of psychiatric conditions (mania, depression, schizophrenia, hallucinosis, hysteria with amnesia, and intoxications) or conditions affecting cerebral function (diffuse or local brain damage).

The *diffuse brain damage* may be associated with intrinsic changes such as head injury, infection, diseases of blood-vessels, " dysrhythmia " (epilepsy, narcolepsy, electroconvulsion therapy), congenital defects, hydrocephalus, demyelination, and degeneration; or with extrinsic factors, such as metabolic disorders, anoxia and anæmia, poisons of many kinds, deficiencies of vitamins or endocrine secretions, and changes in body-temperature.

The *local brain damage* may be the result of tumour, abscess, surgery, trauma, vascular lesions, demyelination, degeneration, or infestation.

This list of conditions associated with alterations of the time-sense includes almost all the major problems of medicine and surgery. Such a judgment supports one of the major contentions of this work—that disorders of the time-sense are very common: perhaps so common that they have become unobtrusive.

Agreement on this point alone would justify the contents of this paper, for our first need in investigating the time-sense is to be able to disengage ourselves from the stream of daily existence so that we can change our obscuring subjectivity for an objective investigation. The matters of our investigation are all about us, and have been for many thousands of years. We need a discipline and a technique by which to re-view them. Biologists have much to teach us in these matters.

Much of the clinical and experimental information is already available, though under such headings as " memory ", " epilepsy ", " schizophrenia ", " stroke ", " depression ".

It is possible that a comprehensive description of disorders of the time-sense will contribute towards the solution of certain difficult problems, such as " consciousness ", " memory ", " localisation of function ". Work in progress appears to be directly connected with the technology of high-speed flying and four-dimensional geometry. Aeronautical scientists already appreciate the need to understand principles of nervous activity and function (Gooddy 1959).

The subject of the personal time-sense has become the concern of several branches of science. In neurology we have passed that moment of government time when a static three-dimensional concept of nervous function can satisfy the needs of scientific advance.

I wish to express my thanks to the librarian of the Royal Society of Medicine for help with reference sources.

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". . . It is this matter of ' communication ' which lies at the root of the Council's work; and assumes a greater importance as the machinery of the Welfare State is elaborated and its philosophy is developed. For there seems to be opposition between these two things. Each year sees additions to the already complicated structure which the State is erecting for welfare, education, health and so on; and with every new job, defined in terms of duties and responsibilities over against a pre-existing job, the problem of communication is increased by the erection of new invisible boundaries. Yet the philosophy which seems at the same time to guide all present-day social thinking is based on the need for coming together, for community responsibility, for bringing our social misfits out of their specialised institutions into the everyday world."—Fortieth annual report of the National Council of Social Service (26 Bedford Square, London, W.C.1); p. 7. 1959.

RESISTANCE TO KETOSIS IN OBESE SUBJECTS

A. KEKWICK
M.A., M.B. Cantab., F.R.C.P.
PROFESSOR OF MEDICINE

G. L. S. PAWAN
B.Sc. Lond.
RESEARCH BIOCHEMIST

T. M. CHALMERS
M.D. Edin., M.R.C.P.
FIRST ASSISTANT

THE DEPARTMENT OF MEDICINE,
MIDDLESEX HOSPITAL MEDICAL SCHOOL, LONDON, W.1

IT has long been recognised that fat people do not readily develop ketosis (Duncan 1959, Kekwick and Pawan 1957). This study was undertaken to try to elucidate the mechanism underlying their resistance.

The level of ketone bodies in the blood (acetone, acetoacetic acid, and β-hydroxybutyric acid) depends on the balance between their rate of production by the liver and their rate of utilisation and excretion. Two possible explanations therefore presented themselves: (1) that the obese could utilise or excrete ketone bodies faster than the non-obese, and thus prevent them accumulating

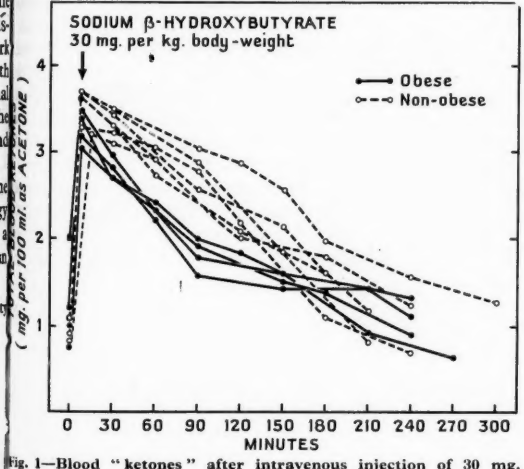

Fig. 1—Blood "ketones" after intravenous injection of 30 mg. sodium β-hydroxybutyrate per kg. body-weight.

in the body; (2) that the obese did not *form* ketone bodies so rapidly.

To test the first hypothesis sodium β-hydroxybutyrate was given to 6 obese and 6 non-obese subjects. In each the dose was calculated in proportion to body-weight and was administered intravenously (30 mg. of sodium β-hydroxybutyrate per kg. body-weight). As in previous papers (Kekwick and Pawan 1956), the obese were defined as those who had such an obvious excess of subcutaneous fat that no doubt could be entertained in any observer's mind that they were too fat. The non-obese were selected by a similar criterion: they were manifestly thin.

Fig. 1 shows the blood values obtained after injection. The values for "total ketones" are expressed as milligrammes of acetone per 100 ml. of blood and were measured by the method previously published (Pawan 1958).* Recalculating the concentrations obtained in terms of sodium β-hydroxybutyrate, it seems that the injected "ketone" was distributed throughout the total body water within a few minutes of injection. The highest concentrations obtained were almost identical in all 12 subjects. The rate of decline of the blood-levels in

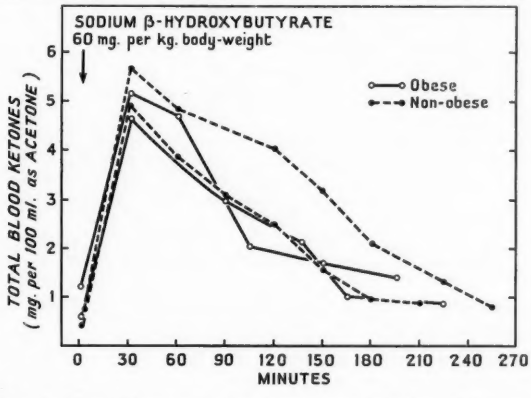

Fig. 2—Blood "ketones" after intravenous injection of 60 mg. sodium β-hydroxybutyrate per kg. body-weight.

the two groups was similar, suggesting that they utilised the sodium β-hydroxybutyrate at about the same rate.

Fig. 2 shows the blood values obtained when twice the above dose was given to 2 obese and 2 non-obese subjects. No difference between the two groups could be seen even when higher initial blood-ketone levels were obtained.

Table I shows the amount of ketone bodies recovered in the urine from 5 of the obese subjects and 7 of the non-obese. The striking feature of these figures is the small amount recovered (less than 1% of the dose given). Stadie (1958) and Campbell and Best (1956) have pointed out that isolated organs and intact animals can utilise ketone bodies readily and that probably almost all tissues of the body have this property. The small proportion of the dose recovered here suggests that this is equally true of human subjects, whether obese or non-obese. The two groups, however, excreted comparable amounts in the urine.

Hence the first hypothesis—that the resistance to ketosis in the obese results from their greater ability to excrete ketone bodies or to utilise them metabolically—does not appear to be tenable.

An attempt to induce ketosis was next made in 14 obese and 8 non-obese subjects by giving them a diet providing 1000 calories, of which 90% was supplied in the form of fat (Kekwick and Pawan 1956). The criterion of non-obesity in this group was not so rigidly applied as in the first experiment, for we were anxious to discover whether

TABLE I—URINARY KETONES EXCRETED DURING 5 HOURS AFTER INTRAVENOUS INJECTION OF SODIUM β-HYDROXYBUTYRATE

—	Total urinary ketones (mg. acetone per 100 ml.)	Percent dose recovered
(Non-obese)	5·1	0·22
	11·0	0·50
	21·2	0·87
	4·6	0·51
	8·7	0·47
	24·5	0·75
	38·2	1·04
Mean	16·1	0·62
(Obese)	4·6	0·19
	12·6	0·35
	12·9	0·51
	24·8	0·54
	12·5	0·23
Mean	13·5	0·36

* The estimation was preceded by oxidation of β-hydroxybutyrate to acetoacetate with acid dichromate.

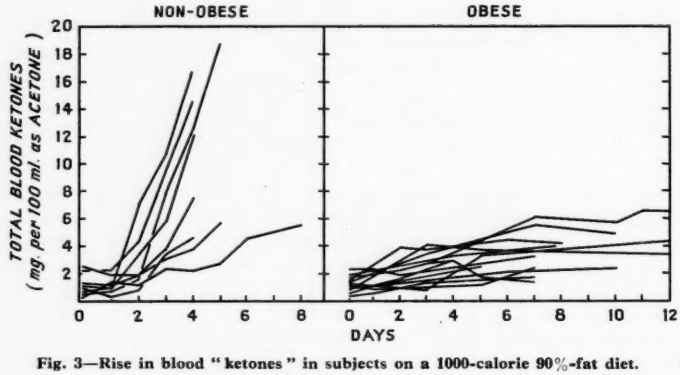

Fig. 3—Rise in blood "ketones" in subjects on a 1000-calorie 90%-fat diet.

those who might wish to reduce weight for cosmetic reasons were liable to ketosis on a high-fat diet. None of the lean subjects, however, would have been treated as obese patients for medical reasons.

The relative resistance to ketosis in the obese was confirmed. All the obese subjects were able to take the diet for as long as required, whereas 7 of the 8 non-obese subjects had to abandon the diet by the fifth day, and the remaining subject on the eighth day, because of symptoms attributed to ketosis (headaches, anorexia, nausea, &c.). The development of symptoms in different individuals, however, did not appear to be closely related to the height of the blood-ketone levels.

Fig. 3 shows the rate of rise in blood ketones in the two groups, and it can be seen that the obese had a slower rise in blood ketones than the non-obese.

Fig. 4 shows the output of urinary ketones in the two groups. As might be expected, the amount excreted was much greater in the non-obese. In studies of post-exercise ketosis, Johnson and Passmore (1959) have pointed out that the rate of excretion of acetoacetate is related in a linear manner to the blood concentration, while the excretion of β-hydroxybutyrate is exponentially related to blood concentration.

Taken in conjunction with the first experiments, these results suggest that resistance to ketosis in the obese results from a diminished production of ketone bodies.

It is usually thought that ketone bodies are formed only in the liver (Campbell and Best 1956, Stadie 1958) and that their rate of formation depends on the availability of carbohydrates. Blood-sugar values were recorded in both groups during the dietary period. Table II shows that in all but 2 of the non-obese subjects there was a significant fall in the fasting blood-sugar concentration—a fall which is much less evident in the obese. It can be further noted that this fall took place mainly on the first and second days after starting the diet. Fig. 3 shows that in most subjects the rise in blood ketones took place on or after the second day of the dietary period and was on the whole consequent upon the appearance of hypoglycæmia.

The daily carbohydrate intake of the two groups was identical, and amounted to only 12 g. This is clearly less than the daily requirements for both. An obvious possible source of additional carbohydrate was from body protein, and nitrogen balances were therefore carried out in both groups during the dietary period. From fig. 5 it is clear that the non-obese were in negative nitrogen balance whereas the obese were almost in nitrogen equilibrium.

TABLE II—FASTING BLOOD-SUGAR LEVELS IN SUBJECTS ON A 1000-CALORIE 90%-FAT DIET

Non-obese subjects

Days								
0	1	2	3	4	5	6	7	8
86	81	90	84	72	..	..	..	..
76	88	72	69	65	..	..	..	..
91	75	78	..	59	60	..	..	..
84	58	..	61	59	..	..	..	..
97	..	79	..	54	57	65	..	54
84	88	74	65	..	..	..	..	..
83	68	66	58	56	..	..	..	..
92	76	64	63	60	60	..	..	..

Obese subjects

Days								
0	1	2	3	4	5	6	7	8
92	..	..	74	..	84	..	..	98
84	..	80	..	..	90	..	..	..
104	..	92	..	78	..	..	86	..
96	..	..	78	..	..	..	85	..
92	88	..	80	..	..	..	86	..
90	..	..	..	..	..	..	94	..
98	..	90	..	82	..	..	74	..
86	82	..	..	..	75	..	82	..
105	..	..	88	..	..	..	92	..
86	..	88	..	..	78	..	74	..
90	86	78	76	84	..	..	94	..
82	..	..	..	..	78	..	..	..
88	..	80	..	92	90	..	84	..
86	..	..	..	..	..	..	81	..

The non-obese had an average nitrogen balance of −8·6 g. a day as opposed to −1·5 g. in the obese; representing a daily breakdown of about 54 g. and 10 g. of protein respectively. Thus the extra carbohydrate available to the obese could not have come from nitrogenous sources.

A simple calculation can now be made in respect of the carbohydrate available in the two groups. It is clear (table III, lines 1, 2, and 3) that in both of them the carbohydrate from the diet or body proteins is far below the minimal daily requirements. It is generally accepted that the human brain utilises carbohydrate as its principal source of energy (Lambertsen et al. 1953). Blood leaving the brain has a respiratory quotient of 0·97 and the rate of utilisation of oxygen is 5·25 ml. per minute. The needs of the brain alone are therefore of the order of 75 g. glucose a day. Such a figure

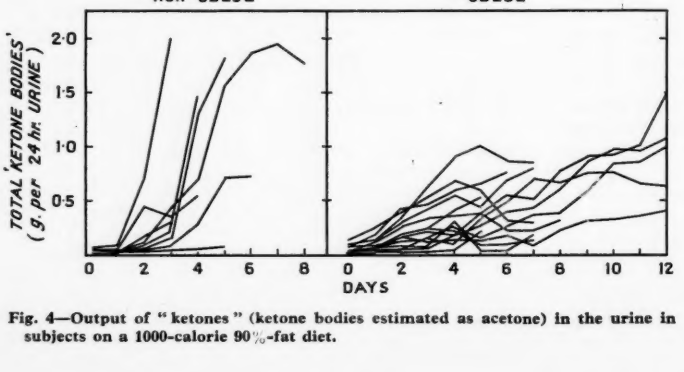

Fig. 4—Output of "ketones" (ketone bodies estimated as acetone) in the urine in subjects on a 1000-calorie 90%-fat diet.

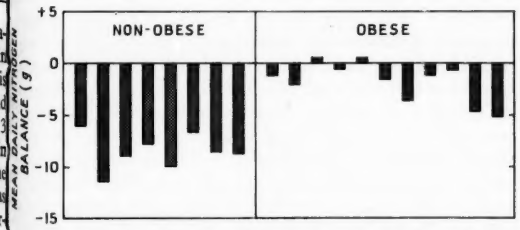

Fig. 5—Nitrogen balances in subjects on a 1000-calorie 90%-fat diet for 4–14 days.

is almost certainly on the low side. Doubtless other organs also require some carbohydrate for their normal metabolism.

Table III, lines 4 and 5, extends this calculation to show that neither group of subjects was getting enough carbohydrate to supply even the brain alone with its daily needs, and that the apparent deficit in the obese group was much the greater. Both groups therefore must have obtained carbohydrate from some other source, and it is our belief they could obtain it only from fat.† Such a conclusion is by no means new (Lyon et al. 1932). The evidence both for and against the possibility is summed up by Weinman et al. (1957). They conclude that it is still uncertain whether conversion of fat to carbohydrate with a net gain in carbohydrate can take place in man; but it is difficult to escape the conclusion that it must have happened in these subjects.

It seems clear that in man the minimal daily needs for carbohydrate lie between 75 g. a day (the amount necessary for brain metabolism) and 400 g. a day (the normal carbohydrate intake). There is, however, no evidence that the daily needs are the same for the two groups studied here. The minimal needs may well be less in the obese because

TABLE III—SUMMARY OF DAILY CARBOHYDRATE BALANCES IN THE NON-OBESE AND OBESE GROUPS ON 90%-FAT DIET

—	Non-obese	Obese
Carbohydrate available from diet (g.)	12	12
Carbohydrate available from protein (g.)	31	6
Total measurable carbohydrate daily (g.)	43	18
Minimal daily carbohydrate needs of brain (g. daily) ..	75	75
Carbohydrate available from unidentified source (g.) ..	32	57

other sources of energy, such as fatty acids, can be more readily used by the tissues. If this is not so, the data suggest that obese people can produce more carbohydrate from non-protein sources (i.e., from fat).

Summary

1. It is much more difficult to induce ketosis in obese than in non-obese people.

2. The difference does not appear to depend on a higher rate of utilisation or excretion of ketone bodies by the obese. After intravenous injection of sodium β-hydroxybutyrate the rate of disappearance of this ketone body from the blood was found to be the same in obese as in non-obese people. Less than 1% of the injected dose was excreted in the urine: the amount excreted was the same in the two groups.

3. Presumably, then, the rate of production of ketone bodies is less in the obese.

4. In non-obese people given a high-fat diet the development of ketonæmia and ketosis was preceded by a fall in the fasting blood-sugar concentration. In obese people on this diet, there was no such fall or it was small; and they did not develop ketosis to any significant degree.

5. Reasons are given for believing that net conversion of fat to carbohydrate took place in both groups. It is suggested that obese people may be able to turn fat into carbohydrate at a higher rate than non-obese people.

We should like to thank Miss E. Wilkinson Hughes, principal dietitian, Middlesex Hospital; Miss M. Clode for biochemical help; Miss C. M. Evans for secretarial assistance; and two ward sisters, Miss R. S. Starkey and Miss J. Ward.

† S. B. Furnass (unpublished data) has found twenty-four-hour non-protein respiratory quotients around 0·7 in obese subjects on a 1000-calorie 90%-fat diet.

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CONTROL OF ANTICOAGULANT THERAPY
A TRIAL OF THROMBOTEST

J. M. MATTHEWS
M.B. St. And.

W. WALKER
M.A., M.B. St. And., M.R.C.P.

DEPARTMENT OF PHARMACOLOGY AND THERAPEUTICS, QUEEN'S COLLEGE, UNIVERSITY OF ST. ANDREWS, AND CLINICAL INVESTIGATION UNIT, MARYFIELD HOSPITAL, DUNDEE

UNTIL a better understanding of the pathogenesis of thrombotic disease permits a more fundamental and physiological approach to its treatment, it seems likely that long-term therapy with coumarin or indanedione derivatives will have to be given to ever-increasing numbers of patients who have had myocardial infarction or recurrent venous or arterial thrombosis in other parts of the body. The question now at issue is not so much the advisability of this treatment in appropriate cases as the actual selection of the most suitable patients and of the best methods for control of therapy. The problem of organisation is a big one and will doubtless be solved in different ways in different countries and regions. Important suggestions have been made recently by Owren (1959a) in Norway, Wright (1959) in the United States, Toohey (1959) in England, and Douglas (1959) in Scotland.

Another problem, relevant to organisation, concerns the laboratory methods that should be used. Once again, unless a particular technique is plainly proved to be superior to all others, the test chosen is almost certain to vary from place to place and the precise manner of its performance will also vary with circumstance. This paper presents an initial assessment of the new and ingenious technique devised by Owren (1959b).

Present Methods of Control

The methods in use at present are the one-stage " prothrombin-time " of Quick (1935), and the " P & P " (prothrombin and proconvertin) method of Owren and Aas (1951). The former, besides being a landmark in the physiology of clotting, is still by far the most commonly used method for adjusting coumarin dosage. It is familiar to clinical pathologists and hospital doctors in general who, despite its theoretical and practical shortcomings, have confidence in the method and find it tolerably safe.

TABLE I—THE CLOTTING FACTORS DEPRESSED BY COUMARIN ANTICOAGULANTS, AND THE DEFICIENCIES REVEALED BY THE THREE TESTS

Factor VII	Prothrombin	Factor IX (Christmas)	Factor X (Stuart-Prower)
Quick test P & P test Thrombotest	P & P test Thrombotest	Thrombotest	Thrombotest

Its limitations, however, are often unappreciated and its disadvantages overlooked. The common practice of reporting results as percentages of normal " prothrombin activity ", from a dilution curve of normal plasma, gives an entirely false impression of accuracy even when infinite pains are taken with frequent dilution curves from pooled normal plasma; and the difficulty of preparing a standard tissue thromboplastin makes it extremely difficult to compare the results of one laboratory with those of another. The use of a " prothrombin index " expressing the control clotting time as an arithmetical percentage of that of the test plasma, still followed in some places, is even more confusing. These difficulties can be avoided by simply reporting the clotting-time of the test together with the clotting-time of the control plasma for the day (the " prothrombin ratio ").

Even so, the Quick test still has the disadvantage of giving an incomplete reflection of the coagulation defects produced by coumarin-type drugs (table I). No fewer than four of the recognised clotting factors are reduced by this treatment: prothrombin, factor VII, factor IX (Christmas factor), and factor X (Stuart-Prower factor). In coumarin-treated patients, as also in patients with liver disease or vitamin-K deficiency, the Quick test is virtually a measure only of the deficiency in factor VII. In practice, in control of treatment this is not so great a disadvantage as it might seem, since in most cases the four factors appear to be decreased in parallel and a patient in the therapeutic range for factor VII (i.e., in the therapeutic range for the Quick test) is likely to be safely controlled in respect of the other factors as well. Exceptions, however, are now well known: the " prothrombin-time " may be very long without hæmorrhage occurring, whereas bleeding may start unexpectedly, and continue, when the patient is well within the Quick " therapeutic range ". These cases probably account for a fair proportion of the hæmorrhagic complications of coumarin drugs. A simple or feasible method which eliminated this hazard without reducing the efficacy of the treatment would be a great advance in anticoagulant therapy, as well as being of practical value in the assessment of patients with liver disease or vitamin-K deficiency.

The P & P method is generally recognised, in laboratories with experience of both methods, to be somewhat safer and more sensitive than the Quick test. This may be because it gives a combined estimation of prothrombin and factor VII. It involves, however, the use of ox plasma filtered through asbestos and has proved a difficult technique outside specialised laboratories. Besides, it takes no account of factors IX and X and is therefore subject, in lesser degree, to the criticism already made of the Quick method (fig. 1).

Thrombotest

The new test, called by its author Thrombotest (Owren 1959b), is designed to overcome this disadvantage by the use of a reagent which reflects sensitively the reduction in all four factors depressed by coumarin therapy, or in vitamin-K deficiency or liver disease. The new reagent, prepared commercially, contains a crude cephalin, a weak tissue thromboplastin made from horse brain, and normal plasma from which all the factors reduced by coumarin drugs, but no others, have been removed. Stored in ampoules as a freeze-dried powder it has the two additional advantages of remaining stable for many months and of being suitable for use with capillary as well as venous blood. It is dissolved in distilled water for testing capillary blood, and in a weak calcium-chloride solution for testing citrated venous blood. The procedure of the test is simply to add 0·1 ml. of whole blood to 0·5 ml. of reagent at 37°C, and observe the clotting-time. Normal blood gives a clotting-time of 35–40 seconds. The result is expressed as a percentage of normal read from a correlation curve prepared from dilutions of pooled normal plasma. For any one batch of reagent, because of its stability, such a curve is said to be valid for any subsequent tests done with this batch. This makes it possible for the manufacturer to supply ready-made correlation

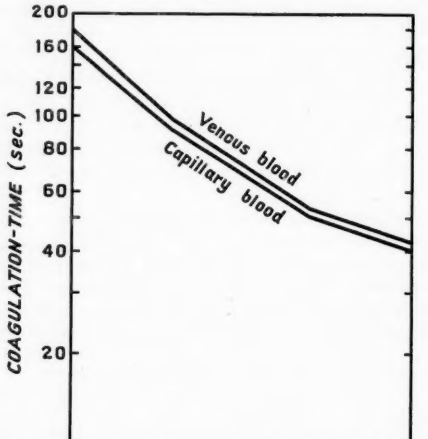

Fig. 1—The correlation curves, for capillary and venous blood, supplied with a batch of thrombotest reagent.

curves, for capillary and venous blood, with the reagent (fig. 1). The actual shape of the curve is the one most useful for presenting results as a percentage of normal, since its most sensitive and accurate portion lies across the therapeutic range of 10–30%.

The claim made by Owren for his new technique is that its simplicity, reliability, and safety make it the method of choice for the decentralised control of treatment in the large numbers of outpatients we may expect in the near future. Our own results suggest that this claim is well founded, but must be modified by certain minor disadvantages or sources of error which are well recognised by Owren and discussed in detail in his paper (1959b); in our initial experience, however, they have been somewhat more troublesome than in his. This is a common finding when a new technique is first tried outside its parent laboratory, and need in no way detract from the merits of the innovation.

Here we present the results of tests done reliably under optimal conditions, and then discuss the difficulties found unless special precautions are taken. These are the difficulties that would be met, at least initially, in the

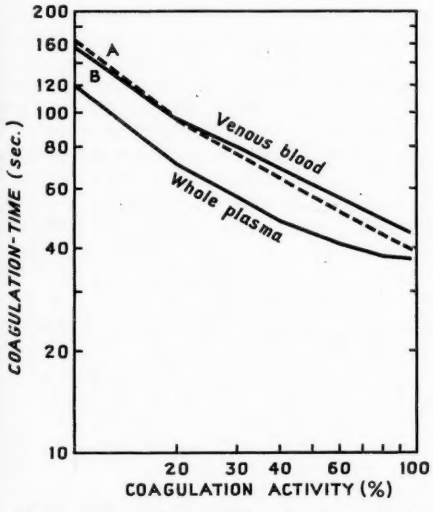

Fig. 2—Showing (above) the correspondence of a correlation curve for whole blood supplied with a batch of reagent (A) and the curve for that batch prepared by the authors (B); and (below) the correlation curve for whole normal plasma. (Blood taken into siliconed tubes.)

widespread use of the test for the control of outpatients in routine laboratories.

The technique followed was strictly that recommended by Owren except for one procedure—the collection of venous blood into citrate. In most of these experiments, instead of taking 0·2 ml. of 3·13% sodium citrate into a 2 ml. syringe and then filling it to the 2 ml. mark with blood, a siliconed syringe containing no citrate was used to draw the blood, which was immediately measured into tubes graduated to receive 5 ml. and containing 0·5 ml. of citrate. Smaller amounts could equally well be taken in a similar manner. It was felt that in most cases the brief sojourn of the non-citrated blood in siliconed glass was more than offset by the greater accuracy of measurement; while an imperfect venepuncture would invalidate both methods equally.

Results and Discussion

Under optimal conditions the test is simple and reliable, giving clotting-times that are reproducible, in any given patient or sample, to within a second either way, and with a sharp unmistakable endpoint. The correspondence between tests done with capillary blood and tests done with citrated blood taken from the same patient at the same time is very close indeed: if the precautions mentioned below are observed the results are usually identical in terms of percentage of normal.

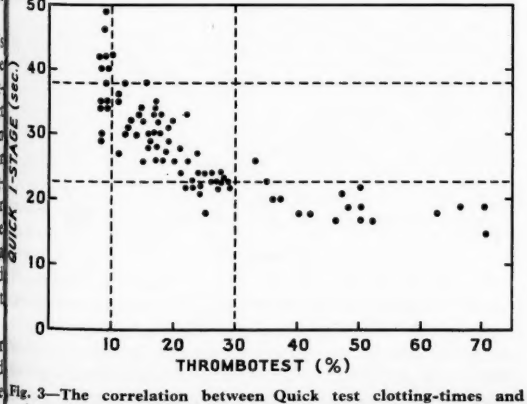

Fig. 3—The correlation between Quick test clotting-times and thrombotest results (%) in patients under treatment. In each case lines are drawn to indicate the therapeutic range.

The stability of the reagent and the reproducibility of the dilution curves supplied by the makers were tested for several batches of reagent. Correlation curves as described by Owren were prepared by making dilutions of pooled normal plasma in citrate-saline and plotting their clotting-times against percentage on double logarithmic paper; a mixture of saline and plasma in the preparation 3 : 2 being taken as 100% so that the curve could be used for whole venous blood. In each case the curve so prepared was virtually identical with that supplied with the batch of reagent tested (fig. 2). There seems, therefore, no reason to doubt the reliability of these ready-made curves for venous and capillary blood.

The test is obviously intended by its author to be used with whole blood, whether capillary or venous, since he makes no mention of tests on plasma as such, nor of correlation curves for plasma as distinct from whole blood. This is consistent with his object of simplifying the whole procedure, and indeed marks a great advance in technique. There seems no reason, however, why plasma should not be used where circumstances are favourable or convenient. Dilution curves for pooled normal plasma (the plasma itself being taken as 100%) were prepared and are as suitable for use as those for whole blood (fig. 2). In a few cases, such as significant anæmia, the use of plasma might be preferable since it would obviate the correction factor that has to be applied to the whole-blood test when the packed-cell volume is very abnormal.

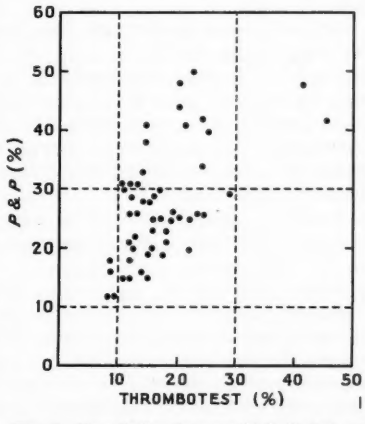

Fig. 4—Correlation between P & P test and thrombotest in patients under treatment. The lines indicate the therapeutic range.

In patients under treatment a good correlation was found between thrombotest in the range 10–30% of normal and a Quick-test clotting-time, in seconds, of between $1^1/_2$ and $2^1/_2$ times the control figure (fig. 3)—i.e., the thrombotest therapeutic range recommended by Owren accords with the somewhat modest therapeutic range recommended by Biggs and Macfarlane (1957), and also by Hunter and Walker (1954) on the grounds that when the Quick-test clotting-times are within this range the thromboplastin-generation test (using the patient's serum) is nearly always impaired. Similarly, in the present study all the patients in the range 10–30% with thrombotest had impaired thromboplastin-generation tests. This might be taken as additional evidence that higher doses of coumarins than that required to double the prothrombin-time are not only undesirable but unnecessary.

TABLE II—VARIATIONS IN THROMBOTEST RESULTS WITH SAMPLES OF CITRATED BLOOD IN GLASS (G) AND SILICONED (S) TUBES, AT DIFFERENT TIME-INTERVALS AFTER COLLECTION. THE FIGURES ARE PERCENTAGES OF NORMAL

Specimens	Within 2 hr.		12–14 hr.		24 hr.	
	G	S	G	S	G	S
1	22	20	18	18	12	18
2	17	16	16	16	13	12
3	16	14	15	14	Clotted	14
4	24	21	21	21	11	19
5	23	20	20	20	Clotted	Clotted
6	100	96	96	74	70	70
7	22	20	18	19	13	18
8	17	16	16	15	13	12
9	16	14	15	15	Clotted	14
10	24	21	21	21	11	19
11	21	20	21	18	21	16
12	12	13	15	17	18	17
13	16	16	19	21	15	17
14	12	12	16	17·5	14	14
15	11	11	13	12	12	12
16	65	65	75	65	75	75

The correlation between thrombotest and the P & P test was not quite so good (fig. 4). This probably reflects imperfections in the P & P technique compared with that of Owren; but it does suggest that somewhat higher doses would be needed to achieve the therapeutic range with the P & P test, as used in this laboratory, than with thrombotest.

These results were obtained either with capillary blood from a generous cut in the side of the fingertip, or with citrated blood tested very soon after collection into siliconed glassware. They are free from the difficulties that arise unless certain precautions are taken. With these precautions, the test probably approaches the ideal for control of anticoagulant therapy; without them, the results could be misleading.

Unlike the Quick and the P & P tests, thrombotest is sensitive to the contact factor that plays an important part in the earliest stage of coagulation. This means that the clotting-times with the thrombotest reagent will show a significant variation depending on the amount of activation of the contact factor that has taken place in the blood or plasma through contact with glass. The greater the glass surface, and the longer the contact, the shorter the clotting-times will tend to be. This applies even to the capillary-blood method, in which a short wide-bore pipette must be used and the flow of blood must be free and copious to permit rapid transference to the reagent. If there is any delay in this, as there may well be with a volume as large as 0·1 ml., the clotting-time is shortened appreciably. In this study this shortening was found in treated patients as well as in normal controls. Plastic pipettes might overcome this difficulty but have not been tried so far. The use of smaller volumes of blood and reagent was attempted in this trial but gave inconsistent and unreliable results.

TABLE III—VARIATIONS IN THROMBOTEST RESULTS WITH SAMPLES OF CITRATED BLOOD IN GLASS (G) AND LUSTEROID (L) TUBES, AT DIFFERENT TIME-INTERVALS AFTER COLLECTION. THE FIGURES ARE PERCENTAGES OF NORMAL

Specimens	Within 2 hr.		6 hr.		12 hr.		24 hr.	
	G	L	G	L	G	L	G	L
1	19	19	24	24	24	24	23	22
2	20	20	24	28	23	27	21	24
3	24	26	28	31	27	31	27	27
4	26	25	29	28	25	28	25	22
5	18	19	23	20	26	20	18	17
6	29	31	31	35	31	36	27	31
7	22	23	21	22	21	24	19	20
8	13	15	15	15	16	15	13	13
9	17	19	20	19	20	19	19	17
10	26	28	28	30	29	31	28	29

Another consideration affecting the capillary method is the patient's preference. Owren contends that a cut in the side of the fingertip is free from pain, but that has not always been the impression of the patients in this study, most of whom would prefer a venepuncture to a large cut in the finger. The solution probably lies in the use of the warmed ear-lobe, where a nearly painless cut will nearly always provide an adequate sample without delay.

With stored venous blood the activation by glass contact is more obvious, being often apparent at two hours and striking at twelve hours (tables II and III). Owren states that the use of siliconed syringes and siliconed or 'Lusteroid' tubes prevents this change, but in this trial considerable changes—both shortening and lengthening of the clotting-times—have been found in stored samples even in silicone and lusteroid (tables II and III, fig. 5). It is true that expressed as percentages these variations are least noticeable when the result is within the therapeutic range, but they are still significant in a fair proportion of samples. A common pattern of change is a significant activation, with shortening of the clotting-time by 20 seconds or more at six and twelve hours, with a return to very nearly the original clotting-time at twenty-four hours. This may mean, as Owren claims, that posted samples are reliable, and indeed several samples in lusteroid tubes posted by this laboratory to itself have given identical results on arrival, after twenty-four hours or more, with those on immediate testing. The changes observed in this interval may have some explanation other than activation and may be a purely local difficulty. It might be met in other places, however, and has to be considered and if possible explained and avoided before the most confident use can be made of this valuable innovation for the delayed testing of citrated venous blood.

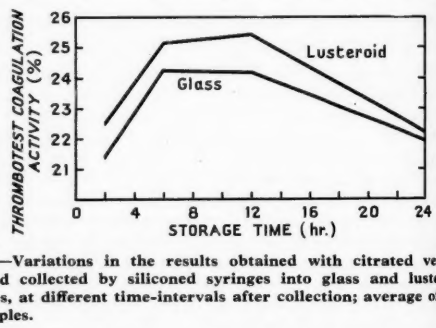

Fig. 5—Variations in the results obtained with citrated venous blood collected by siliconed syringes into glass and lusteroid tubes, at different time-intervals after collection; average of ten samples.

The last possible disadvantage of thrombotest is the cost of the reagent. At present this is about 4*d.* for a single test compared with 2*d.* or less per test for the commercial tissue thromboplastins used in the Quick test, and with negligible cost if a home-made preparation of human brain is used. The cost of the reagent, however, is only a fraction of the total cost of anticoagulant therapy: the largest single item is the time of medical or technical staff, and the adoption of thrombotest may well reduce this.

Conclusion

By the use of thrombotest, decentralisation of control is already being achieved in Norway. There is as yet in this country insufficient experience of the method in the actual control of dosage, but there seems no doubt that, in careful hands, it could achieve both of its objects—greater simplicity and greater safety. But it is certainly not so simple as to be safe in casual or inexperienced hands

Whatever the method of control, this form of therapy must still be handled with respect. Familiarity with the treatment as a whole and regular clinical supervision are as important as the details of laboratory procedure, and changes in these can only bring marginal if important improvements. Even with this reservation, however, thrombotest marks a great advance in blood coagulation techniques. It is as neat an example as one could wish for of theoretical possibilities being fulfilled by technical expertise. In routine laboratories it is likely to become the procedure of choice in controlling anticoagulant therapy and in following the clotting defect in liver diseases.

Summary

The advantages and disadvantages of current laboratory procedures for the control of anticoagulant therapy are briefly discussed.

An initial trial of thrombotest, a new method devised by Owren (1959b), is described. Although it demands certain precautions in performance, its advantages over all earlier methods are likely to confirm it as the best laboratory procedure for the control of anticoagulant therapy.

The authors thank Prof. P. A. Owren and Prof. R. B. Hunter for their comments and suggestions, and Professor Owren and Nyegaard & Co., Oslo, for a generous supply of the reagent.

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CÆRULOPLASMIN IN WILSON'S DISEASE

VICTOR M. ROSENOER
M.B., B.Sc. Lond., M.R.C.P.
FIRST ASSISTANT TO THE MEDICAL UNIT, ST. GEORGE'S HOSPITAL, LONDON, S.W.1

GEOFFREY FRANGLEN
B.Sc. Lond.
LECTURER IN CHEMICAL PATHOLOGY, ST. GEORGE'S HOSPITAL MEDICAL SCHOOL

Wilson's disease (hepatolenticular degeneration) is an inborn error of metabolism characterised by coarsely nodular cirrhosis of the liver associated with progressive damage to the nervous system, particularly in the lenticular region. The clinical manifestations usually appear in late childhood or adolescence, the predominant symptom being tremor, rigidity, titubation, dysarthria, and dysphagia. In some families cirrhosis is prominent, and episodes of ascites or hæmatemesis may occur. More commonly symptoms of liver damage are entirely absent, though some cirrhosis is invariably present. Pigmentation of the outer margin of the cornea occurs in the form of a smoky-brown or grey-green ring (the Kayser-Fleischer ring); this is seen best by oblique illumination and is characteristic of the disease, being present in the majority of patients.

The pathogenesis of this disorder is still obscure, but notable advances have been made since the demonstration of tissue-copper retention (Haurowitz 1930, Glazebrook 1945, Cumings 1948). This disturbance in copper metabolism appears to be an essential feature, and is manifested by a high urinary copper output (200–700 μg. in 24 hours) and diminished fæcal copper excretion. The degree of abnormality varies, and isolated normal findings do not exclude the diagnosis. Radioactive-copper studies have shown a greater net absorption of copper from the bowel (Mathews 1954, Bearn and Kunkel 1955, Bush et al. 1955), but it is not clear whether this results from increased intestinal absorption of copper or from diminished biliary excretion of copper (Bickel et al. 1957).

Hyperaminoaciduria occurs in most, but not all, cases of Wilson's disease (Uzman and Denny-Brown 1948, Stein et al. 1954) whilst glycosuria, hyperphosphaturia, hyperuricosuria, and peptiduria have been reported (Cooper et al. 1950, Uzman and Hood 1952, Mahoney et al. 1955, Bearn 1957). This may be related to copper deposition in the kidney, which might interfere with the transport mechanisms in the tubular epithelium.

In the vast majority of cases of Wilson's disease the total serum-copper level is low, though Bearn and Kunkel (1954) report that normal levels may be found occasionally. Normally 95% of the total serum-copper is bound to cæruloplasmin, an α_2 globulin containing copper and possessing in-vitro oxidase activity (Holmberg and Laurell 1947, 1948). The remaining dissociable fraction of the serum-copper is loosely bound to albumin. In Wilson's disease the lowered serum-copper is associated with an even more pronounced diminution in the level of serum-cæruloplasmin (Scheinberg and Gitlin 1952, Bearn 1953). According to the currently favoured hypothesis, deficient synthesis of cæruloplasmin is the primary metabolic error (Bearn 1953, Earl et al. 1954); the serum-copper fraction, loosely bound to albumin, is increased and thereby more easily available for deposition in the tissues and for excretion in the urine.

We describe here a case of Wilson's disease with normal serum-copper and copper-oxidase levels.

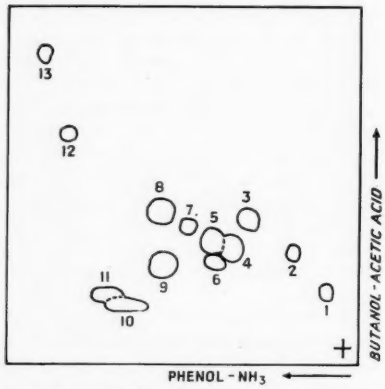
Case-report

A schoolgirl aged 14, in the care of Dr. J. R. Nassim, was quite well though slightly overweight until August, 1958, when tremor of the hands was noted. She found increasing difficulty in writing and holding a cup and was seen to have a fine tremor of the head. These symptoms have slowly progressed, although there is considerable variability in the severity of the tremor from moment to moment. At her last visit (April, 1959) she was almost unable to write at all. Clinical examination in October, 1958, showed typical Kayser-Fleischer rings with head and body tremors, and a fine tremor and incoordination of both arms, particularly the right. Reflexes throughout the

BIOCHEMICAL DATA

—	Oct. 30, 1958	Jan. 22, 1959	March 5, 1959	April 2, 1959
Plasma-bilirubin (mg. per 100 ml.)	1·0	0·5	0·4	0·4
Plasma-alkaline-phosphatase (units)	17·5	17·0	18·5	18·0
Thymol turbidity (units)	1·7	1·3	0·9	2·3
Thymol flocculation	Neg.	Neg.	Neg.	Neg.
Prothrombin-time (sec.)	13 (control 12·5)	..	..	16 (control 12·5)
Plasma-protein:				
Total (g. per 100 ml.)	7·3	8·0	..	7·8
Albumin " "	..	3·8	..	..
Globulin " "	..	4·2	..	..
Electrophoresis	Increased γ-globulins	Increased γ-globulins	..	Normal
Serum-uric-acid (mg. per 100 ml.)	..	..	3·0	..
Serum-copper (μg. per 100 ml.)	Oct. 22: 90 Oct. 30: 100	..	..	..
Serum copper-oxidase:				
Warburg technique (μl. O_2/ml./hr.)	Oct. 22: 81 Oct. 30: 74	..	36	75
Ravin's method (units)	..	..	0·27	0·18

body were abnormally brisk, especially in the right leg and left arm. No abnormality was found in the cardiovascular or respiratory systems. The liver and spleen were impalpable. The relevant biochemical data are shown in the accompanying table.



Two-dimensional chromatogram of urinary aminoacids: 1, cystine; 2, aspartic acid; 3, glutamic acid; 4, serine; 5, glycine; 6, taurine; 7, threonine; 8, alanine; 9, glutamine; 10, histidine; 11, lysine; 12, methionine; 13, phenylalanine.

Urine.—17-ketosteroids 8 mg., 6 mg. in 24 hours; copper 131 μg., 225 μg., 187 μg. in 24 hours; amino-nitrogen 233 mg., 317 mg., 308 mg. in 24 hours. Moderate aminoaciduria was found (see figure).

The patient is at present being treated with penicillamine 900 mg. daily, together with potassium sulphide 60 mg. daily, in divided doses. As yet there has been no clinical improvement although the urinary copper has increased to 3370 μg. in 24 hours.*

Discussion

The early clinical diagnosis of Wilson's disease is not easy, since both the hepatic and neurological symptoms vary greatly in severity; laboratory evidence is seldom definite enough to confirm the diagnosis in isolated cases in the absence of Kayser-Fleischer rings. Our patient presents a combination of symptoms (tremor and incoordination) and signs (Kayser-Fleischer rings, hypercupruria, hyperaminoaciduria, and slightly impaired liver function) reproduced in no other known disease; at the same time the serum-copper and copper-oxidase levels are within normal limits.

Bearn (1959) has remarked on the wide scatter of serum-cæruloplasmin levels in Wilson's disease, whilst Enger (1959) has described the case of a 35-year-old man with the usual clinical and histological features of Wilson's disease, in whom the serum-copper level was 77 μg. per 100 ml. and the serum-cæruloplasmin level was normal when determined by an oxidase method. He noted severe hepatic damage and suggested that consequent inhibition of œstrogen degradation in the liver might be associated with the normal cæruloplasmin level. In this connection Bearn (1957) demonstrated a rise of both serum-copper and serum-cæruloplasmin levels in three of seven cases of Wilson's disease treated with œstrogens. There is little evidence, however, that œstrogen metabolism is impaired in cirrhosis of the liver (Cameron 1957). Possibly the cæruloplasm in these " aberrant " cases is structurally abnormal and, although possessing in-vitro copper-oxidase activity, may be deficient in its normal and as yet unknown physiological role.

It appears from these cases, and from the present case, that Wilson's disease may exist with normal serum-cæruloplasmin levels, and that cæruloplasmin synthesis may continue in this disorder. Complete reappraisal of the role of caeruloplasmin should therefore be considered. Uzman (1953) has suggested that Wilson's disease is a genetically determined generalised defect of protein metabolism in which abnormal tissue proteolytic activity leads to the formation of protein or polypeptide residues with a high affinity for copper. This would result in secondary diminution of cæruloplasmin synthesis either by withholding the necessary copper or by blocking the synthesising systems of the body. Direct evidence is lacking, but the possibility that the low serum-cæruloplasmin levels found in Wilson's disease are merely secondary and not an essential feature must not be discounted.

In the light of this evidence, we conclude that the role of cæruloplasmin in the pathogenesis of Wilson's disease is uncertain, and that the diagnosis of this disease is not precluded by a normal serum-cæruloplasmin level.

* Since this paper was written she has improved considerably and is now able to write.

Summary

In a case of Wilson's disease serum-copper and serum-cæruloplasmin levels were found to be normal.

We should like to thank Prof. J. N. Cumings for the serum-copper and copper-oxidase estimations and for his advice and criticism; Mr. S. Miller and Mr. K. Lyle for their opinions on the Kayser-Fleischer rings; and Dr. Denis Williams for his opinion on the neurological disorder. One of us (G. F.) wishes to thank the Funds of St. George's Hospital for financial assistance during the work.

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THE ABNORMAL APPENDIX

JOHN JEWERS
M.B. Aberd., F.R.C.S.
SENIOR SURGICAL REGISTRAR, WEYMOUTH AND DISTRICT HOSPITAL

THE following observations concerning the abnormal appendix are based on experience gained from a personal series of 1238 appendicectomies, together with those cases which I have had the opportunity to examine but see others treat when I was holding more junior appointments. I was stimulated to write this account after reading published articles, in particular the review by Rees (1955) in which he stated that 100 people die each month from appendicitis in the British Isles, and the report of Lee et al. (1957) which quoted the mortality from this disease when treated in teaching and peripheral hospitals.

Most surgeons would agree that as soon as appendicitis has been diagnosed the appendix should be removed (given adequate facilities). The case for conservative treatment (Coldrey 1956) is slender, and such treatment

should be applied only when insuperable difficulties prevent the patient from being transferred to an adequate surgical centre. While the general practitioner may be content to diagnose " appendicitis " or " not appendicitis ", the surgeon must be able to diagnose with reasonable certainty what the appendix is like and where it is situated, and he must know the best method of dealing with it—which usually means operation. But in the case of the patient reaching hospital two, three, or four days after the disease has started, the surgeon must decide whether the opportunity for removal has passed, or whether it would be better to let the natural body defences continue to wall off the infection, appendicectomy then being performed two or three months later when the abdomen is clean.

The following observations are less concerned with the straightforward case of appendicitis than with the more difficult cases which can be spotted by the experienced. I refer, of course, to retrocæcal, pelvic, or retromesenteric appendices, and to appendicitis in the very young and very old.

The appendix may be grossly inflamed in a patient who looks extremely well and who has no increase in pulse-rate or temperature. In addition, there may be very few physical signs. This, to my mind, constitutes the greatest pitfall in assessing a case " over the telephone "—a practice which is to be deprecated. Every surgeon in charge of abdominal emergencies must see for himself, and the only place to assess the case is at the bedside. I well remember a cheerful man of forty-five who was admitted to hospital as " ? appendicitis ", with a pulse-rate of 70, temperature 98·2°F, and slight guarding over McBurney's point. After examining him, I arranged to remove his appendix an hour later. On opening the abdomen the appendix was grossly inflamed, with free dirty fluid and advanced peritonitis. I had not diagnosed such an advanced inflammatory process, but I often cite this case because it makes me remove the occasional normal appendix, rather than overlook another similar state of affairs. I consider that a surgeon need never make excuses for occasionally removing a normal appendix. The safe policy of " look and see, rather than wait and see " is admirable, though it should not be made an excuse for the indiscriminate removal of normal appendices.

In this series the youngest patient was sixteen months, and the oldest eighty-four years. Appendicitis is said to be rare under two years, but I think it is not uncommon; 2 of my cases were under two (eighteen and sixteen months). At the other extreme the 2 oldest cases were aged seventy-five and eighty-four. Several cases in the mid-seventies have been treated by others. In the very young, infection in the appendix produces a higher temperature and pulse-rate than in older children, and the disease is more rapidly progressive because, in the absence of omentum, the infection is less readily walled off. In the aged the rise of pulse-rate and temperature are slight, despite gross pathological processes, and the physical signs are less clear until perforation ensues. Unless operated on early, these old people combat the infection poorly, and they are candidates for complications—e.g., pulmonary emboli, chest infections, or intra-abdominal abscesses.

A third type of patient may be introduced at this point—namely, the obese tough man of fifty, who reaches hospital forty-eight hours after the onset of symptoms, with only the slightest guarding in the right iliac fossa. Pulse-rate and temperature may be normal. If such a man calls in his doctor because of pain in his abdomen, he *has* a pain in his abdomen due to no small degree of pathological change, and early removal of the appendix is warranted.

Of the 1238 appendicectomies 11% were high retrocæcal appendices, 5% were retromesenteric or retroileal, and 9% were pelvic.

THE HIGH RETROCÆCAL APPENDIX

Infection of the appendix which is tucked well up behind the cæcum, especially an undescended cæcum, presents with pain in the epigastrium or, possibly, the right side. Pulse-rate and temperature remain normal until the disease is well established. Tenderness may be absent, and vomiting is uncommon. If present, tenderness may be elicited by compressing the cæcum between the two hands in front and behind the abdomen, or by pressing over the lateral wall of the abdomen about 4 in. in front of the renal angle. Once diagnosed, operation is best performed through a right paramedian incision, sited where the surgeon anticipates the appendix will be. (I have removed an appendix which lay in front of the first part of the duodenum—for advocates of the muscle-splitting incision this would have been grand exercise.) Beware of labelling the cause of symptoms " renal colic " because red blood-cells are found in the urine.

The figure of 11% for retrocæcal appendices may seem unduly low; Aird (1949) mentions 64%. But many appendices are tucked up just behind a normally situated cæcum and are easily removed. In my records " retrocæcal " denotes those appendices really hidden behind a cæcum which itself lies high in the abdomen—the local term for these cases is " worthy opponents ". That there is a 10% chance of finding a worthy opponent is a further argument in favour of my choice of incision (vide infra).

THE RETROMESENTERIC OR RETROILEAL APPENDIX

Kerr (1955) gave a good description of the retromesenteric or retroileal appendix. I have only kept specific records of appendices so situated of recent years, and I find that the inflamed retromesenteric appendix can be diagnosed with considerable certainty. Far more common in children and young adults, it was found in 5% of cases.

The onset of symptoms is sudden, accompanied by vomiting and diarrhœa. This looseness of the bowels should be a direct pointer to the diagnosis. The tongue is clean. Temperature and pulse-rate may or may not be raised. Guarding is only slight, because the appendix is protected from the palpating hand by the cæcum and ileum, but, to the suspicious, an area of tenderness just above and medial to McBurney's point suggests the diagnosis with confidence. All cases of diarrhœa and vomiting should be examined closely to rule out appendicitis as the cause.

These cases still tend to reach hospital late, the reasons being that (*a*) the correct diagnosis is not made, and (*b*) the infection may wall itself off reasonably well initially though this process eventually breaks down and the abdomen becomes grossly soiled. A nasty friable appendix, often short and with a small mesentery, has then to be removed, causing anxiety to the surgeon who sees the neighbouring ileum as a potential source of further trouble because of obstruction due to adhesions between loops of ileum. This may occur about a week later, when a second operation and/or a Ryle's tube and intravenous therapy to control electrolyte imbalance may be necessary.

THE PELVIC APPENDIX

The inflamed appendix situated in the pelvis is associated with central or hypogastric pain, looseness of the bowels, some

vomiting, and, not uncommonly, frequency of micturition. The pulse-rate and temperature may be unaffected until the pathological changes are considerable. Tenderness is slight, arising over the pubis, above the right inguinal ligament, or even in the *left* iliac fossa. The diagnosis can be made easily and early on rectal examination, as opposed to the inflamed retroæccal appendix, when rectal examination is negative. Removal of a pelvic appendix is technically easy, as the cæcum can be mobilised and the appendix brought to hand. If the appendix is removed early the risks of pelvic abscess and, later, obstruction from adhesions between loops of small bowel, are reduced.

At this point, may I make a plea for rectal examination in *every* case of abdominal pain? This is advisable because (*a*) the newly qualified doctor can learn the feel of the normal rectum, prostate, &c., and the variations of the normal, and can thus recognise more easily the abnormal, and (*b*) other pathological processes are spotted which might be neglected (e.g., in a woman of sixty, admitted with a strangulated femoral hernia, routine rectal examination revealed a symptomless carcinoma of rectum, which was removed after recovery from the operation to cure her hernia).

THE OBSTRUCTED APPENDIX

Textbooks refer to obstruction of the appendix by a fæcolith. This is, of course, dangerous because of its liability to rupture and flood the peritoneum with highly infected material. The obstructed appendix causes more severe pain, more frequent vomiting, greater tenderness and guarding, and a higher pulse-rate and temperature than does the acute catarrhal type of inflammation. But, if allowed to go on long enough, the catarrhal appendix will become obstructed by virtue of its proximal lumen becoming obliterated by œdema; thus the aforementioned sequelæ may appear. The obstructed appendix must be removed immediately.

General Observations

I would stress particularly that the patient must be examined and treated *as a whole*. Pain in the right iliac fossa may have a multitude of causes. Amongst my personal clinical notes are 6 cases of pneumonia admitted as appendicitis, 1 of meningitis, 4 of perforated diverticula of the colon (in all of these tenderness was maximum over McBurney's point), and the case of a boy of fifteen with a perforated duodenal ulcer. Many examples of mesenteric adenitis are seen. An accurate history and complete examination, including the tonsils, will lead to the answer. Headache is a very rare symptom of appendicitis, and any patient who complains of pain in the right iliac fossa and headache should be examined very carefully to ensure that nothing is missed before treatment for appendicitis is instituted.

I should like also to stress two other aspects.

Firstly the case is sometimes first seen by a doctor just as, or shortly after, the appendix has perforated, flooding the peritoneum with pathogenic organisms. The body's reaction is dramatic—the patient becomes blue and cold, with rapid thready pulse, low blood-pressure, rapid respirations, opening and closing of the alæ nasi, and generalised but not localised pain and tenderness in the abdomen. The picture may suggest pneumonia, but, as the patient is watched, the body's defence mechanism comes into play, and twenty minutes later the condition has changed again. The pulse-rate and blood-pressure improve, the skin becomes warmer and the lips pinker, the distressed expression relaxes, and tenderness localises to the right iliac fossa. Secondly, a child with acute appendicitis who falls asleep may be harbouring a dirty appendix, sleeping from exhaustion after hours of pain.

The best method of removing an inflamed appendix is often argued (Ewing and Monro 1953). The advocates of the muscle-splitting incision favour the most direct approach to the appendix to avoid unnecessary soiling of the abdomen. But this presupposes that *all* surgeons can diagnose correctly the position of the appendix in *every* case. I cannot do so, and I think many will make the same admission. Adequate exposure is one of the main principles of surgery, and gentle handling of the tissues is another. A good piece of advice is not to have too many instruments in the wound at the same time.

Having seen others battle, and remembering my own tussles when trying to remove a retrocæcal appendix through a muscle-splitting incision, I now use, and strongly advocate, the paramedian incision. My reasons are: (*a*) it is easier to make and to extend, if necessary; (*b*) the approach to other organs is better if one's diagnosis is wrong; and (*c*) hernia is a rare sequel (in contrast to the muscle-splitting incision). The argument for the muscle-splitting incision seems to me valueless. If the abdomen is a little soiled at operation the body will deal with it; if grossly soiled, the organisms are already far beyond the neighbourhood of a paramedian incision. I do not, of course, include in these remarks the direct approach to an appendix abscess or to an inflamed appendix late in pregnancy.

My ideas on drainage and antibiotics have changed with the passage of time and the acquisition of experience. My interest in surgery coincided with the advent of sulphonamides, when drainage of the " dirty " abdomen was commonplace. Later, with the introduction of antibiotics, drainage was considered unnecessary except for the dirtiest cases. Now I tend to drain a little more often and to use antibiotics less frequently. This alteration of principles is an essential part of the surgeon's mental approach to everyday problems, if success is to be achieved as the years go by.

Antibiotics are very useful in the treatment of the dirty appendix, and lifesaving in cases with gross peritonitis. But they can cause troubles anew if used indiscriminately. For the grossly soiled peritoneum I favour chlortetracycline intravenously for the first few days only. Once the patient is obviously not going to die from generalised peritonitis, the drug should be stopped so that the body can take over. Pus may collect, but this can be dealt with, whereas a solid antibiotic " mess " in the pelvis (frozen pelvis) cannot be tackled in the same way. It used to be thought that antibiotics would prevent wound infection; but they do not do so reliably. Instead of infection appearing early, it occurs later—often twenty-four hours before the patient is due to go home. My attitude now is that it is better to have " proper " pus with which one can deal, keeping antibiotics until they are really needed. (Compare the breast abscess treated with antibiotics, which presents as a hard indefinite mass, wellnigh indistinguishable from carcinoma.) A generation of young doctors is growing up with the idea that antibiotics will cure everything and that the formation of pus is to be abhorred. But for centuries patients have been cured without antibiotics.

I do not mean to be pompous in making these remarks. They are prompted by a genuine wish to help younger doctors who are too " antibiotic-minded ".

In support of my views I give the results achieved by a reasonably experienced surgeon working in a provincial hospital, without selection. I have removed appendices, varying from the mild " catarrhal " type to the " filthiest ".

6 patients died as a result. But 3 of these were fortuitous—i.e., due to factors which are not completely controllable. (In any series, if one goes on long enough, the occasional patient will die, but all must be included.) These 3 were: an obese woman of forty-eight who, on her fourth postoperative day, sat up and died instantaneously of a coronary thrombosis; a man of twenty-eight who died on the twelfth day of a gross pulmonary infarct; and another man, aged thirty, who died twenty-eight days after operation, and who had been at home for over two weeks. The 2 men were young and in neither was the abdomen very dirty, nor was rest in bed prolonged. Another fatality was in a child aged two years who, having sat up suddenly on the sixth postoperative day, vomited, inhaled some of the vomit, and died before any measures could be taken; necropsy revealed obstruction due to coils of adherent ileum and a pericæcal abscess. The fifth fatal case was that of a man of forty-seven, from whom a very dirty appendix was removed after forty-eight hours' symptoms; three days later he developed paralytic ileus; this settled, but on the sixth postoperative day he vomited, became blue and cold, showed signs of a left common-iliac embolus, and died six hours later. The death of the sixth case was a bitter disappointment. After three days' abdominal pain advanced peritonitis was found, the gut being flaccid and lustreless. Although seemingly moribund, she survived only to develop a subphrenic abscess, a fæcal vaginal fistula, and skin necrosis due to the noradrenaline used to tide her over the crises. She eventually became ambulant, and success seemed to be in view, but she succumbed to long-continued infection six months after admission.

I cannot give accurate figures for all the types of appendicitis which make up this series. My own records are brief, and in a peripheral hospital one has neither the time nor the facilities to look up detailed records. But to forestall criticism, I would say that this series comprised a mixed group of cases such as comes the way of any general surgeon—catarrhal and obstructed appendices with localised infection, others with mild peritonitis, and many with generalised peritonitis. (The numbers in the last category were swollen by summer visitors who had had abdominal pain for twenty-four hours or more before leaving home, but who had been afraid to call in a doctor lest their holiday arrangements be upset.)

83 times the abdomen was opened with a provisional diagnosis of acute appendicitis and the appendix was normal; in these cases the pathological process varied from constipation to a large gangrenous diverticulum of the cæcum requiring hemicolectomy (but as a paramedian incision had been used this was easy). The mortality-rate was 0·42%.

Summary

A series of 1238 mixed cases of appendicitis was treated, with a mortality-rate of 0·42%.

Each case must be assessed by the surgeon at the bedside; and the site and nature of the inflamed appendix must be diagnosed before the best method of treating the patient can be determined.

For appendicectomy a paramedian incision is advised.

Antibiotics should be used to save life in the worst cases; their indiscriminate use is deprecated.

Most cases were in the Weymouth and District Hospital, and I am indebted to the consultants who afforded me the opportunity to treat them. The help of the theatre-sister, ward-sisters, and nurses, has been greatly appreciated.

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RESPONSE OF INFECTED URINARY TRACT TO BACTERIAL PYROGEN

M. A. PEAR
M.D. Lond., M.R.C.P.
TUTOR IN CLINICAL MEDICINE, DEPARTMENT OF THE REGIUS PROFESSOR OF MEDICINE, RADCLIFFE INFIRMARY, OXFORD

B. J. HOUGHTON
M.B. Lond.
REGISTRAR, DEPARTMENT OF CLINICAL PATHOLOGY, ST. MARY'S HOSPITAL, LONDON, W.2

ALTHOUGH chronic pyelonephritis is now recognised as one of the commonest causes of renal failure, its diagnosis remains difficult, particularly in patients whose disease is in apparent remission, or who never develop clinically obvious exacerbations. It seemed possible that this difficulty might be lessened if the infected kidney could be shown to be in some way sensitive to parenterally administered bacterial products, and if evidence of such sensitivity could be found in the urine. In this paper we present the results of observations on the changes induced by bacterial pyrogen on the urinary cellular excretion-rates of six normal subjects, seventeen patients in whom the diagnosis of pyelonephritis was regarded as established beyond reasonable doubt, and three patients known to have non-infective renal disease.

Material

The control subjects were six normal healthy males who gave no history of urinary-tract infection at any time. The urine of all was free of protein and showed a normal excretion-rate of white and non-squamous epithelial cells.

The relevant history and clinical, biochemical, and other findings for each of the seventeen patients with chronic pyelonephritis are briefly summarised.

Case 1.—Female, aged 17. No history. Admitted with anæmia and a blood-urea of 120 mg. per 100 ml. Blood-pressure 140/90 mm. Hg. The urine contained a large excess of leucocytes and numerous gram-negative motile bacilli. Urine culture produced a heavy growth of *Escherichia coli*. Presacral pneumogram failed to show the right kidney. The left kidney was shrunken and grossly distorted.

Case 2.—Male, aged 65. No history. Blood-pressure 200/110, blood-urea 220 mg. per 100 ml. Necropsy showed bilateral chronic pyelonephritis.

Case 3.—Female, aged 33. Repeated episodes of fever, dysuria, and pain in the right loin since the age of 14. Culture of the urine produced *Esch. coli*. Intravenous pyelography (I.V.P.) showed dilated, clubbed, and deformed renal calyces on the right side.

Case 4.—Female, aged 36. Episode of pain in the left flank with dysuria at 6 years of age. I.V.P. combined with tomography showed that the kidneys were of unequal size and grossly irregular in outline. The pelves were dilated, the calyces were clubbed, and the cortex of each kidney was reduced in thickness. The urine contained *Esch. coli*.

Case 5.—Female, aged 29. Frequent episodes of loin pain, fever, and dysuria since 1952. I.V.P. showed bilateral nephrolithiasis and hydronephrosis. At pyelolithotomy in 1952 the right kidney had an irregular surface and a thickened, adherent capsule.

Case 6.—Male, aged 58. Repeated episodes of right loin pain, fever, dysuria, and sometimes hæmaturia for twenty-five years. Blood-urea 60 mg. per 100 ml., blood-pressure 190/110. I.V.P. showed stones in the calyces of the right kidney.

Case 7.—Male, aged 49. History of fever, pain in the right loin, dysuria, and hæmaturia in 1930. In 1958 I.V.P. showed numerous stones in the right kidney. Right nephrectomy was performed, and the kidney showed the histological appearance of chronic pyelonephritis.

Case 8.—Male, aged 44. History of recurrent pain in the left loin with dysuria and fever from 1935 till 1940. A stone was removed from the left kidney in 1940. In 1958 I.V.P. showed deformed calyces on the left side. The urine contained protein. Blood-pressure 180/100, blood-urea 60 mg. per 100 ml.

Case 9.—Male, aged 48. History of recurrent episodes of rigor, fever, and dysuria since 1951. I.V.P. showed a right-sided hydronephrosis. The urine culture produced a heavy growth of *Esch. coli*.

Case 10.—Female, aged 19. History of repeated episodes of loin pain, fever and dysuria for five years. *Esch. coli* were grown from the urine. Blood-urea 60 mg. per 100 ml. Blood-pressure normal. I.V.P. showed bilaterally deformed renal calyces and dilated pelves.

Case 11.—Female, aged 48. In 1948 staphylococcal septicæmia and renal failure developed. Staphylococci and, later, *Esch. coli* were grown from the urine. In 1958 I.V.P. showed a large right-sided hydronephrosis. The urine contained protein and numerous pus cells.

Case 12.—Female, aged 59. History of repeated episodes of loin pain, fever, and dysuria for ten years. Blood-urea 66 mg. per 100 ml. I.V.P. showed no excretion of contrast medium on the right side. Retrograde pyelography showed a small right kidney with a very irregular outline and much reduction of the cortical thickness. The calyces were dilated and deformed.

Case 13.—Female, aged 37. A history of repeated episodes of pain in the right loin, fever, and dysuria for twelve years. The urine contained *Esch. coli*. I.V.P. showed dilatation of the right renal pelvis with deformities of the calyces on this side.

Case 14.—Male, aged 53. Repeated episodes of pain in the right loin with fever and dysuria for one year. Blood-urea 65 mg. per 100 ml. Blood-pressure normal. I.V.P. showed dilatation of the right renal pelvis with deformity of the calyces.

Case 15.—Male, aged 39. Rigor, fever, and dysuria in 1948. In 1958 I.V.P. showed calculi in the calyces of both kidneys.

Case 16.—Male, aged 57. No history. I.V.P. showed an irregularly scarred right kidney. The patient died subsequently from cardiac infarction. At necropsy, bilateral chronic pyelonephritis was demonstrated.

Case 17.—Female, aged 52. History of repeated episodes of fever and dysuria with pain in the left loin since 1932. I.V.P. showed a small left kidney with an irregular outline and dilated and deformed calyces. The urine yielded a heavy growth of paracolon bacillus.

In addition, three patients who had non-infective renal disease were studied.

Case 18.—Male, aged 21. Nephrotic syndrome. One month before admission gross œdema without antecedent or concomitant constitutional disturbance. The urine contained numerous white blood-cells, some granular casts, a few red blood-cells, and up to 15 g. of protein per litre. The blood-urea was normal, plasma-albumin 2 g. per 100 ml., plasma-cholesterol 370 mg. per 100 ml.

Case 19.—Male, aged 25. Focal glomerulonephritis. Two episodes of hæmaturia at the same time as the onset of a sore throat. Admitted during a recurrence of these symptoms. No œdema. Blood-pressure normal. Blood-urea normal. Throat swab grew a β-hæmolytic streptococcus. The urine contained protein and very large numbers of red blood-cells. Renal biopsy showed focal glomerulonephritis.

Case 20.—Male, aged 21. Five years' persistent proteinuria with slight œdema of the extremities. Normal blood-pressure and blood-urea. Slight œdema of the legs. Plasma-albumin 2·8 g. per 100 ml. The urine contained much protein and excess of white blood-cells and granular casts.

Methods

The rate of excretion of white and non-squamous epithelial cells was determined by the method of Houghton and Pears (1957). One hour before observation was begun, and thereafter throughout the test, the subject was given 350 ml. of water to drink per hour. Before the intravenous injection of pyrogen, three control specimens of urine were collected—in the early experiments at hourly intervals, while in later ones the interval was decreased to thirty minutes. 'Pyrexal' (Wander) was given intravenously in a dose of 0·007γ per kg. body-weight. This substance is a purified lipopolysaccharide derived from *Salmonella abortus equi*. After the injection, four specimens of urine were collected at half-hourly intervals, starting from the time of collection of the last control specimen. The cellular excretion-rate was determined on all seven specimens of urine obtained, and the deposit from 10 ml. of each specimen was stained by Gram's method to demonstrate organisms. From all female patients, the urine was collected through an indwelling urethral catheter. Endogenous pyrogen was produced by incubating the amount of pyrexal appropriate to the subject with 100 ml. of his whole heparinised blood in a sterile bottle for six hours in a water bath at 37°C (Gerbrandy et al. 1954). The mixture was then injected intravenously. Temperatures were taken in the mouth by clinical thermometer.

Results

Changes in Cell-excretion Rate in Patients and Controls

Fig. 1 shows that after the injection of pyrogen the cellular excretion-rate of the controls was unchanged, but that the patients showed a great increase within 30 minutes.

Changes in Urine Flow and in Cell-excretion Rate

It was thought possible that, after the injection of pyrogen, changes in the urine flow might be correlated with changes in the urinary cellular-excretion rate. In fifteen patients the average urine-flow for the periods after the injection was calculated and compared with the corresponding value for the periods before the injection.

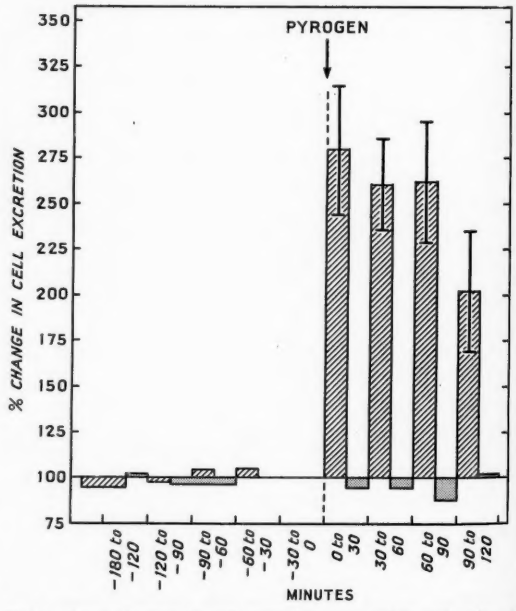

Fig. 1—Mean changes in cell-excretion rate before and after the injection of bacterial pyrogen, expressed as a percentage of the rate in the period immediately before the injection. Hatched columns show the mean changes observed in 17 patients with chronic pyelonephritis; stippled columns represent those in 6 normal subjects. The standard errors of the means for the patients after pyrogen are shown.

In neither group before pyrogen did the means differ significantly from 100%, nor did they do so for the controls after pyrogen.

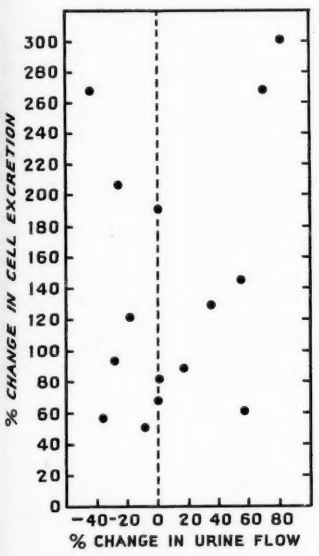

Fig. 2—Changes in urine-flow and cell-excretion rate in 15 patients after the injection of bacterial pyrogen.

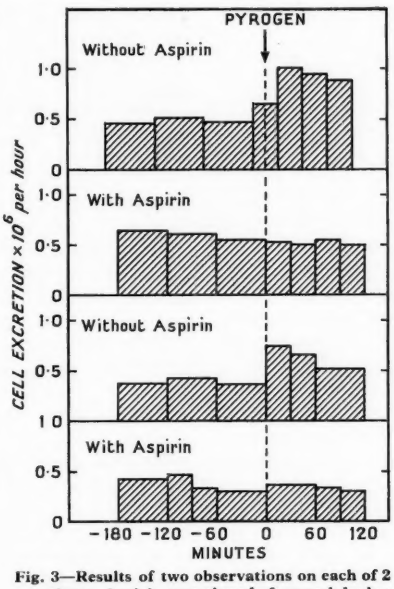

Fig. 3—Results of two observations on each of 2 patients. Aspirin was given before and during one period of observation.

The difference was then calculated as a percentage change, using the average value before the injection as 100%. Similar calculations were applied to the urinary cell-excretion rates before and after the injection. Fig. 2 shows that there is no correlation between changes in urine-flow and changes in cell-excretion rate after the injection of pyrogen.

Changes in Renal Blood-flow and in Cell-excretion Rate

It was thought possible that the changes observed in cell-excretion rate in patients might be related to changes in renal blood-flow, which is known to be increased by bacterial pyrogens (Chasis et al. 1938). Antipyretics are known not to prevent the increase in blood-flow produced by bacterial pyrogens. Two separate experiments were performed on two patients, in one of which pyrexal alone was given, while in the other gr. 10 of aspirin was given every four hours for twelve hours before and during the experiment. Fig. 3 shows that in neither experiment where aspirin was given did the cell-excretion rate increase, although it did so when pyrexal alone was given.

Pyrogen was also given to one patient with focal glomerulonephritis and to two patients with nephrotic syndrome, all of whom had abnormal cellular excretion-rates before the injection. If changes in blood-flow in damaged kidneys were responsible for the increased cell-excretion rate after pyrogen, then in these three patients an increased rate should occur. Fig. 4 shows quite clearly that in fact it did not, and demonstrates the contrast between the behaviour of the cell-excretion rate after pyrogen in the normal subject and in the three patients just described, and that in a patient with chronic pyelonephritis.

Role of Fever in Increasing Urinary Cell-excretion Rate

If pyrexia per se were responsible for the increased cellular excretion-rate, then fever produced by any means should augment this rate. Two separate experiments were performed on each of five patients. In one endogenous pyrogen (Grant and Whalen 1953), and in the other bacterial pyrogen, was used. Fever was produced in all ten experiments and was always higher after endogenous pyrogen. Fig. 5 shows that bacterial pyrogen always produced an increased cellular excretion-rate in the urine, while endogenous pyrogen never did so. That there was no large systematic difference in the average urine-flows for the periods before and after the injection of each substance is shown in the accompanying table, which is derived from four of the five patients for whom the necessary information was available.

Inability of Heparin to Inhibit the Action

It seemed that the failure of endogenous pyrogen to cause an increase in the urinary cell-excretion rates of the five patients might be due to the fact that heparin, the anticoagulant used in the production of this substance, might inhibit the rise in cell-excretion rate. 100 ml. blood was accordingly taken from two patients, and to it was added the same amount of heparin that had been used in the production of endogenous pyrogen. The blood was incubated at 37°C for six hours and then returned to the patients. Immediately afterwards the appro-

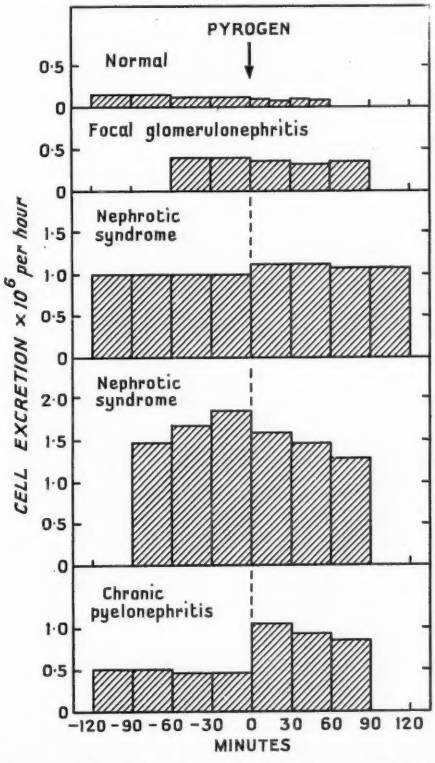

Fig. 4—Behaviour of the urinary cell-excretion rate after the injection of bacterial pyrogen in a normal subject, 3 patients with non-infective renal disease and one patient with chronic pyelonephritis.

CHANGE IN AVERAGE URINE FLOW (ML. PER MIN.) AFTER INJECTION OF PYROGEN

Case no.	After bacterial pyrogen	After endogenous pyrogen
9	+0·8	−2·8
11	−3·4	−0·3
12	−0·8	+1
15	+0·2	−1·3

priate dose of pyrexal was given intravenously. Both patients showed a great increase of their cellular excretion-rates within thirty minutes.

Patients with Normal Cellular Excretion-rate before Injection of Pyrogen

Of the seventeen patients with chronic renal infection, cases 7, 15, and 16 had, before the injection of bacterial pyrogen, a cell-excretion rate below the upper limit of normal of 200,000 per hour. This is shown in fig. 6 and seems important in that it implies that some patients with chronic pyelonephritis do not always excrete an abnormal number of cells in their urine.

Bacteriology

No quantitative bacteriological studies were made on the specimens of urine obtained during these observations, but in cases 1 and 4 organisms were seen in specimens obtained after the injection of pyrogen, where none were seen before; and in cases 3 and 6 the number of organisms increased greatly after the pyrogen was given. In none of these patients did the urine-flow decrease after the injection.

Discussion

It is well known that protein can be found in the urine of febrile patients who show no evidence of infection of the urinary tract. There exist, so far as is known to us, no reports of detailed observations of the effect on the urinary cellular deposit of fever resulting from disease or induced artificially. In 1943 Taylor and Page, who treated patients with high blood-pressure by intravenous injection of bacterial pyrogen, reported that gross hæmaturia and nitrogen retention developed in two. Neither was considered to have an infection of the urinary tract, and no explanation of these observations was apparent. Gow (1919) claimed good results from treating two patients suffering from recurrent infection of the kidney with intravenous injections of a suspension of killed *Esch. coli*. He made no mention of any changes in the urinary deposit immediately after the injections.

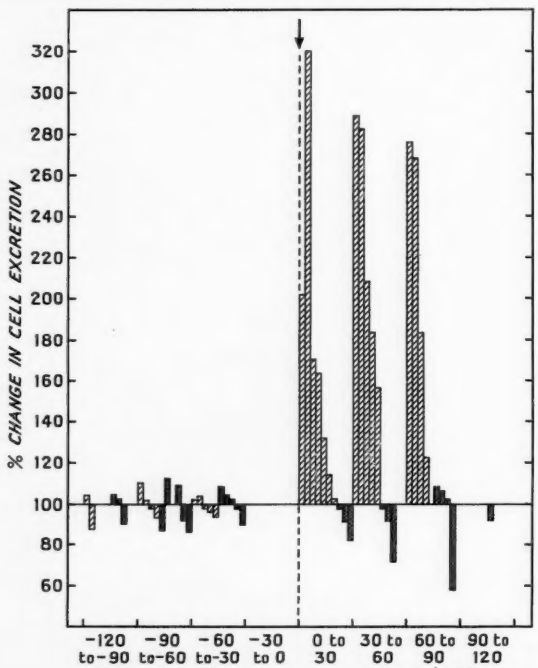

Fig. 5—Changes in the cell-excretion rate in 5 patients after the injection of bacterial pyrogen (hatched columns) and endogenous pyrogen (stippled columns).

The observations reported here establish beyond doubt that the intravenous injection of bacterial pyrogen induces no increase in the urinary cellular excretion-rate of either normal subjects or of a few patients with clear evidence of non-infective renal disease, but that it causes an immediate and large increase in the cell-excretion rates of patients with evidence of chronic pyelonephritis. It must, however, be admitted that these observations afford no conclusive evidence that the excess cells found in the urine of our patients came from the kidney rather than from any other part of the urinary tract. At the time at which the pyrogen was given, no patient had symptoms suggesting infection of the bladder, and all had evidence of infective lesions of the kidney. Of the two patients who subsequently died, both had histological evidence of chronic pyelonephritis and in neither were lesions of the bladder or ureters found; but it remains no more than probable that the changes seen in the urine originated in the only organs known to be diseased—the kidneys.

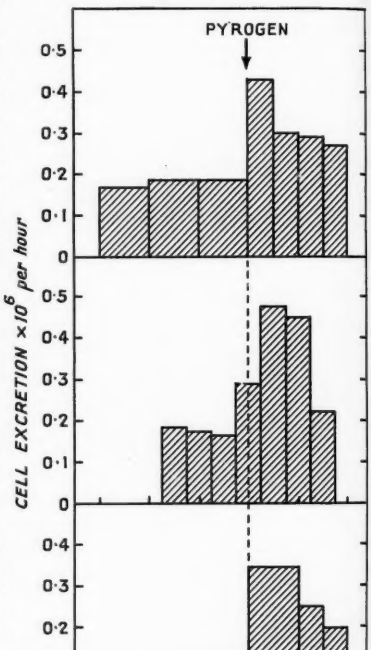

Fig. 6—Normal cellular excretion-rates in 3 patients before the response to the injection of bacterial pyrogen.

When the work described here was begun, it was supposed that bacterial pyrogen might in some way provoke an exacerbation of chronic renal infection, so that what had been latent would become obvious; but the cellular excretion-rate increased in all our patients within thirty minutes and had begun to decrease within two hours after the injection. It seems therefore that the changes induced in the excretion-rate occur far too rapidly and are far too evanescent to be explained on the basis of an artificially induced exacerbation of a chronic infective process. Nor did any patient subsequently develop sus-

tained fever or symptoms suggesting a recrudescence of infection. It is true that in two patients the urine, which before the injection of pyrogen had been free of bacteria, contained bacteria later in the experiment, and that in two further patients the urine, which had contained bacteria before the injection, contained many more after it. But it seems probable that the bacteria appeared as the result of an inflammatory reaction rather than that they were its cause.

The fact that there is no correlation between the urinary flow and cellular excretion-rate in normal subjects (Houghton and Pears 1957) does not necessarily mean that changes of cellular excretion-rate induced by bacterial pyrogen in patients with an abnormal renal tract will likewise not be correlated with urinary flow. It is conceivable that in an infected kidney some nephrons, producing little urine before the injection of pyrogen, might be loaded with leucocytes and renal epithelial cells; and if, after the injection, the urine-flow in these nephrons were for any reason to increase abruptly, these cells might be swept into the bladder and thus cause a large increase in the cellular deposit of the urine. But fig. 2 shows that of fifteen patients who showed an increase in cell-excretion rate in the urine after the injection of pyrogen, in six the urine-flow increased, in three it remained unchanged, and in six it decreased. Furthermore, in two separate experiments performed on each of five patients (in one bacterial pyrogen was given, in the other endogenous pyrogen was used) after the injection of bacterial pyrogen all showed an increased urinary cell-excretion rate; but after endogenous pyrogen, none showed such an increase (fig. 5). The table shows that there was no large systematic change in urinary flow before and after the injection of either substance.

It seemed possible that changes in the renal blood-flow induced by the bacterial pyrogen might in some way cause the changes observed in the urinary cell-excretion rate in our patients. It could be argued that in the kidney which contains foci of inflammation, and in which, on that account, some of the blood-vessels might be supposed to be abnormally permeable, the increase in blood-flow during fever might result in the escape of an increased number of leucocytes from these vessels into the renal tubules. There are, however, several objections to this hypothesis.

Chasis et al. (1938) observed the changes in renal blood-flow in man after the intravenous injection of pyrogen. They showed that for the first thirty minutes after such an injection there was no change in the renal blood-flow; that, with the onset of the rigor, the blood-flow decreased and that it did not increase until between sixty and ninety minutes after the pyrogen had been given. In all our patients the urinary cell-excretion increased within thirty minutes, and in some, in whom the appropriate observations were made, it did so within fifteen minutes after the injection of bacterial pyrogen. Moreover, fig. 1 makes it quite clear that the average cellular excretion-rate sixty minutes and more after pyrogen, when the renal blood-flow is presumably greatest, is in fact less than that found in the first sixty minutes after the injection when the renal blood-flow is known to be unchanged or diminished.

Goldring and Chasis (1941) showed that antipyretics did not prevent the increase in renal blood-flow after the injection of pyrogen, although they did suppress the fever. Fig. 3 shows the results of two separate experiments on each of two patients to whom bacterial pyrogen was given without, and some days later with, aspirin. Both patients showed an increase in the urinary cell-excretion rate when bacterial pyrogen alone was given; neither showed such an increase when aspirin was given before and during the experiment. Neither the febrile nor the urinary response to pyrexal is ordinarily diminished by one dose some days previously. In the light of these observations it seems quite clear that changes in the urinary cell-excretion rate after the injection of pyrogen are in no way dependent on changes in the renal blood-flow. The cell-excretion rate is greatest when the renal blood-flow is unchanged or diminished, is less when the renal blood-flow is greatest, and shows no change when aspirin is given, although this drug is known not to prevent renal hyperæmia after the injection of pyrogen.

Bacterial pyrogen was also given in three cases of active renal disease known not to be due to bacterial infection. Of these, one was diagnosed by renal biopsy as acute glomerulonephritis at a time when the throat contained β-hæmolytic streptococci, and the other two were diagnosed on clinical and biochemical evidence as the nephrotic syndrome. All these patients had abnormally high cell-excretion rates in the urine before the injection of pyrogen and thus some abnormal permeability of some of their renal blood-vessels. Fig. 4 shows that after the injection of pyrogen the urinary cell-excretion rate increased in none of them, although fever (and thus presumably an increase in renal blood-flow) developed in all.

The results of the experiments in which five patients received bacterial pyrogen and, on a separate occasion, endogenous pyrogen have already been described. In all the experiments fever was produced, but only in those where bacterial pyrogen was given did the urine cell-excretion rate rise (fig. 5). When endogenous pyrogen was given, this cell-excretion fell in many instances. The entirely different response of the urinary tract in these patients to the two types of pyrogen shows conclusively that, in patients with infection of the renal tract, increase in the urinary cell-excretion rate is induced, not by fever, but by the injection of a bacterial substance the pyrogenicity of which is here entirely irrelevant.

If these arguments are valid, it would appear that a bacterial product—in this case derived from *S. abortus equi*, an organism with which few people can be expected to have had contact—can induce at sites in the urinary tract sensitised by chronic bacterial infection a reaction characterised by the escape of leucocytes from the tissues into the urine. It has long been known that in laboratory animals the intravenous injection of heterologous bacterial products can induce inflammatory changes at places already sensitised by bacterial substances or by the presence of bacteria themselves.

In 1924 Sanarelli showed that in rabbits *Vibrio choleræ*, injected in suitable amounts, quickly became localised in the alimentary tract without producing apparent disease for more than a very short time. If, later, a filtrate of *Esch. coli* was injected intravenously into these animals, they died rapidly, and at necropsy hæmorrhage, œdema, and necrosis of the gut were found. Shwartzman (1928a and b, 1930) injected bacterial toxin into the skin of rabbits and, after forty-eight hours, gave an intravenous injection of a filtrate of a culture of an antigenically dissimilar organism. He observed hæmorrhagic necrosis at the sites of the preparatory injection, the first stages of which Stetson (1951) could recognise microscopically within fifteen minutes. Hanger (1928) produced chronic infections with *Bacterium lepisepticum* in the rabbit and showed that, after the intravenous injection of a filtrate of a culture of *Esch. coli*, hæmorrhage and inflammation occurred round the lesions and that blood-cultures previously sterile produced growths of the original infecting organism. Freund (1936) observed that

intravenous injection of filtrates produced from cultures of *Esch. coli*, *Salmonella typhi*, and meningococci produced acute inflammation around experimentally induced tuberculous lesions in the guineapig.

In the past twenty years our knowledge of the significance of chronic pyelonephritis has increased but our ability to diagnose it has not. This is evident both from the multiplicity of more or less complex diagnostic methods that have been suggested and from the fact that it is more commonly recognised in the postmortem room than during the life of the patient.

The reasons for this are well known. A clear history of recurrent acute episodes of urinary-tract infection is often not obtainable; the results of culture of the urine are often negative and more often equivocal, while the methods usually used to demonstrate an abnormal urinary cell excretion are not reliable (Houghton and Pears 1957). An additional and important difficulty is illustrated by fig. 6, which shows that three patients, whose urinary cellular excretion-rates increased immediately after the injection of pyrogen, had normal rates before the injection. The conclusion that because the urinary cellular deposit is normal, renal disease is not present is thus, in at least some cases and at some times, unwarranted.

The consequences of this diagnostic impotence are clear. We do not know which of those patients who have had an acute infection of the kidney from which they apparently have recovered continue to have a chronic infection; we do not know whether such a chronic infection represents a long-continued latent process punctuated by a series of more or less obvious exacerbations, or whether it is in reality a series of new infections arising in already damaged kidneys. We do not know whether the treatment we give eradicates infection from the kidney or whether it merely suppresses it; nor can we tell how many patients whose kidneys are damaged by a non-infective process subsequently develop renal infection in addition to their original disease.

It is clear from the results we present here that the response of patients with infection of the urinary tract to intravenous bacterial pyrogen differs from that of normal subjects and from that of a few patients with non-infective renal disease. This abnormal response can easily be detected in the urine, so that the injection of bacterial pyrogen may constitute a reliable method for the diagnosis of chronic pyelonephritis. It also appears that bacterial excretion occasionally increases in the same way as urinary cell excretion, although further work is necessary on this important point. It is not yet known for how long the abnormal response to bacterial substances persists in patients who have had an acute and apparently self-limited renal infection, nor whether or how often this response can be modified by therapy.

Summary

In seventeen patients with chronic pyelonephritis the urinary cellular excretion-rate increased notably within thirty minutes of the intravenous injection of bacterial pyrogen. In six normal subjects and three patients with non-infective renal disease, no such increase occurred.

The increase in cell-excretion rate in patients with an infected urinary tract is independent of changes in the urine-flow and renal blood-flow, and is not determined by the presence of fever. It appears to be a manifestation of hypersensitivity of an infected tissue to a heterologous bacterial product.

These observations suggest a simple method for the diagnosis of chronic infection of the renal tract.

Our thanks are due to Sir George Pickering and Prof. W. S. Peart for their help and advice.

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ANTIBODY TO THYROGLOBULIN IN PATIENTS WITH THYROID DISEASE

M. H. LESSOF * M.A., M.D. Cantab.
H. J. CRAWFORD M.B., B.Sc. Lond.
R. M. WOOD B.Sc. McGill, Ph.D. Johns Hopkins

From the Department of Medicine and the Wilmer Ophthalmological Institute of the Johns Hopkins Hospital and University, Baltimore, Maryland, U.S.A.

IT is not known whether the circulating antibodies that are found in patients with various thyroid disorders play a part in causing disease or whether they are a secondary result of tissue injury. Since they were detected by Roitt et al. (1956) in cases of Hashimoto's disease, antibodies against different thyroid components have been demonstrated in many other thyroid diseases (Roitt and Doniach 1958) and in some apparently healthy people (Anderson et al. 1959, Blizzard et al. 1959). These antibodies may be found in high titre. If they have a harmful role, the highest titres might be expected in Hashimoto's thyroiditis, which so closely resembles the experimental allergic thyroiditis described by Rose and Witebsky (1956). In general, Roitt's and Doniach's results are consistent with this. To test the hypothesis further, antibodies against thyroglobulin have been studied by a fluorescent-spot technique (Crawford et al. 1959) and by passive cutaneous anaphylaxis in the guineapig (Ovary et al. 1958).

Methods

Thyroglobulin was prepared from human thyroid glands by making a 20% saline brei and precipitating with an equal volume of saturated sodium sulphate solution. Serum, at various dilutions, was injected at several sites on a guineapig's skin. After $2^1/_2$–4 hours the animal was challenged with an intravenous injection of 0·5 ml. of thyroglobulin solution (containing 12·5 mg. of protein) together with 0·5 ml. of a 1% solution of Evans-blue dye. A diffusion of blue dye into the skin defined any area where an antigen-antibody reaction had occurred (Ovary et al. 1958).

Drops of thyroglobulin solution (4 mg. per ml.) were coated on to glass slides and fixed with acetone. Serum, at various dilutions, was then applied, and, after washing, a fluorescein-labelled antiglobulin was used to counterstain antibodies that had become attached to the thyroglobulin (Crawford et al. 1959).

Results

11 positive results were obtained in 100 tests, in which the serum of patients with thyroid disease was tested against thyroglobulin by the passive cutaneous anaphylactic (P.C.A.) reaction in the guineapig. 9 of the positive sera came from patients who had histologically proven Hashimoto's thyroiditis, and in the other 2 cases spon-

* Present address: Guy's Hospital, London, S.E.1.

taneous myxœdema had been diagnosed clinically although biopsy of the gland had not been undertaken.

1 of the patients with spontaneous myxœdema was a man aged 59 with a history of swelling of the neck and voice changes of only a few weeks' duration, whose thyroid gland was palpable at the onset of his illness. The other was a woman aged 68 whose myxœdema had developed four or five years earlier and in whom the thyroid gland was not palpable.

Negative results were obtained with serum obtained from 104 blood-donors and from the following 89 cases of thyroid disease: thyrotoxicosis, 29 cases; non-toxic goitre, 26 cases; myxœdema, 12 cases; acute thyroiditis, 11 cases; Hashimoto's disease more than two years after thyroidectomy, 7 cases; carcinoma of the thyroid, 2 cases; pituitary hypothyroidism, 1 case; congenital athyreosis, 1 case.

Study of 60 patients with various thyroid diseases by means of the fluorescent-spot test gave the results shown in the accompanying table. There were 8 cases in which

POSITIVE REACTIONS TO FLUORESCENT-SPOT TEST FOR ANTIBODIES TO THYROGLOBULIN

Group	No. of subjects	Dilution of serum		
		Nil	1 in 10 to 1 in 40	More than 1 in 40
Blood-donors	104	15	0	0
Non-toxic goitre ..	21	10	2	0
Thyrotoxicosis	10	6	2	0
Acute thyroiditis	5	5	2	0
Hypothyroidism	13	8	3	2*
Hashimoto's disease ..	11	8	8	6*

* Guineapig test also positive in these cases.

the fluorescent-spot test was positive with serum that was more dilute than 1 in 40, and these were the only cases in this group in which the P.C.A. test was also positive. In the 4 cases that gave positive results at very high dilution (between 1 in 1280 and 1 in 5120), the P.C.A. test was positive with serum that was diluted to between 1 in 10 and 1 in 160.

Discussion

The fluorescent-spot test appeared to be more sensitive than the P.C.A. reaction, but apart from this the results of the two tests corresponded closely. The only sera which produced the P.C.A. reaction were those which caused fluorescence at a dilution of more than 1 in 40. It was concluded that the fluorescent-spot test was a useful screening procedure for antibodies to thyroglobulin. The P.C.A. reaction was of considerable clinical value because it gave positive results in active Hashimoto's thyroiditis and a minority of cases of "idiopathic" myxœdema, but in no other condition. The P.C.A. reaction was not obtained in other conditions in which there was extensive damage to the thyroid gland, including thyrotoxicosis after treatment with radioiodine or surgery and acute thyroiditis. These results re-emphasise the similarity between Hashimoto's disease and certain cases of myxœdema and emphasise the distinction from other thyroid disorders in which weak antibodies may be present. It seems unlikely that this distinction could exist if the antibodies in Hashimoto's disease were merely a non-specific and secondary result of tissue damage.

We wish to thank Dr. Samuel P. Asper, Jr., and Dr. Zoltan Ovary for advice and help, and Mrs. Beverley Smith for technical assistance. This work was supported in part by grants (B43-C11 and A-2041-C1) from the Department of Health, Education, and Welfare, U.S. Public Health Service, National Institutes of Health, and in part by grants from the Knights Templar Eye Foundation, Inc., and the Maryland Division of the American Cancer Society.

References at foot of next column

Preliminary Communication

DETECTION OF ANTIBODIES BY FLUORESCENT-SPOT TECHNIQUE

A SIMPLE and sensitive slide technique has been developed for the detection of antibodies in human serum. Thyroglobulin, nucleoprotein, or other concentrated antigens and a fluorescent conjugate with a high fluorescein/protein ratio are necessary. The slides are examined in ultraviolet light against a black background.

MATERIALS

Antigens

Thyroglobulin.—Originally, normal human thyroid gland was homogenised in the cold and mixed with four parts of physiological saline solution; and after standing overnight at 5°C the sediment was discarded and the supernate used as antigen. Greater sensitivity was attained with a purified preparation of thyroglobulin precipitated twice with half-saturated sodium-sulphate solution and dialysed against physiological saline. The protein concentration of the solution, by the biuret method, was 4 mg. per ml.

Nucleoprotein.—This was prepared from minced rabbit spleen by washing with physiological saline containing 0·01 *M* sodium citrate and then extracting with 10 volumes of molar saline, centrifuging, and pouring the supernate into six volumes of distilled water.[1] The viscous mass of nucleoprotein, which precipitated upon dilution, was resuspended in a minimal volume of molar saline. The protein concentration of the material used was standardised at 2·8 mg. per ml.

Serum

This was separated from whole blood within twelve hours of venepuncture and was stored at −20°C until required.

Fluorescent-antibody Conjugate

The material used was a globulin fraction of horse-serum containing antibodies to normal human globulin. This anti-human globulin was conjugated with fluorescein isothiocyanate and was absorbed with acetone-dried beef liver. It had a fluorescein/protein ratio of 11×10^{-3} : 1 and an antibody titre of 1 : 1280 when tested against whole human serum.[2]

METHOD

Glass slides of high ultraviolet transmittance were washed twice in acetone and dried. A platinum loop of 1 mm. diameter was dipped in antigen, which was spread over a 3 × 3 mm. area on the slide. When dry the slides were fixed for ten minutes in acetone, and, if salt crystals were present, a brief wash was given with buffered saline (pH 7·2). Three areas of antigen were equally spaced on each slide, and each serum was tested in duplicate against the outer spots of antigen and compared with a normal control serum, which was applied to the central spot. 1 drop of serum (0·05 ml.), diluted or undiluted, covered the area of antigen completely. The slides were placed in a moist airtight container and agitated by means of a shaking machine [3] for 30 minutes at room temperature. Each drop of serum was washed off separately, and slides were then immersed in three changes of buffered saline for 10 minutes. After drying, the fluorescein conjugated anti-human globulin was applied. 1 drop of conjugate was put on each area of antigen, and the

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slides were shaken again for 30 mintues. The conjugate was washed off in three changes of buffered saline during a 10-minute period. After a final rinse in distilled water, the slides were dried and read.

The slides were examined by holding them in the beam of a 100 watt ultraviolet lamp and observing the fluorescence of the spots directly. The lamp used was a 'Woods Light' with an output of 3600–4000 Å. The result was positive if both test areas fluoresced more brightly than the normal control in the centre. Serial dilutions of positive sera were tested to find the extinction point.

RESULTS

The method gave reproducible results with each of the systems examined. With each new application of the test, different amounts of antigen were used until the optimum concentration was found. Although fluorescence was occasionally obtained with undiluted serum from apparently healthy subjects, this disappeared with dilution of the serum. The degree of dilution required did not prevent the fluorescence which occurred with serum which contained antibody.

In tests in which thyroglobulin was used as the antigen, the serum obtained from 104 blood-donors did not cause fluorescence in dilutions of 1 in 10 or greater. On the other hand, fluorescence was obtained in 17 out of 60 cases of thyroid disease when the serum was diluted to 1 in 10 or more. The highest titres were obtained with serum from patients with histologically proven Hashimoto's thyroiditis and 2 patients with myxœdema of uncertain cause.

In further tests nucleoprotein was used as the antigen and normal serum was used as a control. The serum of 3 patients with systemic lupus caused fluorescence, in 2 cases at a dilution of 1 in 160 and in the 3rd at a dilution of 1 in 80. In 1 patient, who had been treated with prednisone for 2 months, the titre fell from 1 in 160 to 1 in 5. A negative fluorescent test was found in another patient, whose illness was clinically suggestive of lupus erythematosus, but in whom no typical L.E. cells had been found. 92 blood-donor controls had negative tests when their serum was diluted 1 in 5, although 4 gave positive results with undiluted serum. 9 patients with rheumatoid arthritis and 14 other hospital patients were also studied as controls. Only 1 (with rheumatoid arthritis) gave a weakly positive result, which was not present after dilution to 1 in 5. At this dilution non-specific positives were not found among the control subjects.

These results confirm the observations of Holman and Kunkel,[4] Friou,[5] and Goodman and Bowser[6] on the reaction between the serum of patients with systemic lupus and nucleoprotein. The fluorescent-spot technique offers a rapid screening-test for this disease.

We wish to thank Dr. Samuel P. Asper, Jr., for his encouragement, advice, and help, and Dr. Philip Kirol for providing some of the serum which was studied. This work was supported in part by grants (B43-C11 and A-2041-C1) from the Department of Health, Education, and Welfare, U.S. Public Health Service, National Institutes of Health, and in part by grants from the Knights Templar Eye Foundation, Inc., and the Maryland Division of the American Cancer Society.

H. J. CRAWFORD *
M.B., B.SC. Lond.
R. M. WOOD
B.SC. McGill, PH.D. Johns Hopkins
M. H. LESSOF
M.A., M.D. Cantab.

Department of Medicine and the Wilmer Ophthalmological Institute of the Johns Hopkins Hospital and University, Baltimore, Maryland, U.S.A.

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* Present address: Canadian Red Cross Memorial Hospital, Taplow, Bucks.

Medical Societies

HEBERDEN SOCIETY

THE annual general meeting of this society was held at the Wellcome Foundation in London on Dec. 4 and 5. An account of some of the contributions follows.

Proteins of Connective Tissue

The Heberden orator was Prof. A. NEUBERGER, and his subject was The Proteins of Connective Tissue and their Metabolism. He outlined present knowledge concerning collagen, the most important connective-tissue protein in the animal kingdom. Collagen proteins were recognised by certain characteristics, especially a wide angle X-ray diffraction pattern and a small wavelength, 640Å, and a banded structure seen on electron microscopy.

Collagen had an unusual aminoacid constitution. Hydroxyproline was found in elastin but not in collagen, and hydroxylysine was specific to collagen. Large differences in the aminoacid composition were known to occur in collagens from different animals, but all mammalian collagens were very similar. Differences did exist, however, even in different tissues of the same animal, and especially in their hydroxylysine content. Collagens from different species had also been shown to have antigenic differences. Tissues varied in their collagen content, tendon being especially rich (80%); then skin, bone, lung, and stomach had high proportions. It was absent from the brain, except for the connective tissues of the blood-vessels; its concentration was low in the spleen and variable in the muscles. Fibrous collagen and collagenous reticulin fibres of basement membranes were extracellular structures. The collagen molecule had an approximate molecular weight of 345,000 and was highly asymmetrical. It formed fibrils in lengthwise alignment and as the length was about 200 times the width it constituted one of the most asymmetrical structures seen in nature.

Isotope studies had shown that collagen metabolism proceeded very slowly in some tissues (e.g., tail tendons), but rapidly in others (e.g., rat's uterus). Cellular enzymes could degrade collagen and also break down the firm collagen-mineral linkage which constituted 90% of bone protein structure. Other minerals may be bound to collagen, since an isoelectric point of 9·2 at a low ionic strength suggested the presence of basic groups in the molecule. Chloride could be found and may account for selective staining giving a banded appearance to the fibres. As much as 10% of body chloride may be bound to collagen and not exist in osmotic equilibrium. Phosphate could also be bound to the molecule, which could behave like an ion-exchange resin with iron, acid mucopolysaccharides, and hyaluronic acid at different points along the fibre.

Professor Neuberger emphasised that there was no evidence that "collagen diseases" were primarily due to a disease of collagen. Other factors, especially mucopolysaccharides, and tissue proteins other than collagen, might provide more useful information in the elucidation of the cause and pathogenesis of these conditions.

Erythrocyte Survival in Rheumatoid Arthritis

Dr. S. M. LEWIS and Dr. I. PORTER (Hammersmith) reported that blood samples were taken from 50 patients with rheumatoid arthritis, the red cells were labelled with radioactive chromium (^{51}Cr) and then reinjected. The survival-rates of these labelled erythrocytes were compared with those in a control group of 20 healthy people. In the normal subjects the time taken for 50% of the ^{51}Cr to disappear was 25–35 days, and in 46 out of 50 rheumatoid patients the 50% survival-rate fell within normal limits. The other 4 patients showed an early and unexplained loss of 15% of the injected red cells and a shortened 50% survival-time; but when survival studies were repeated in 2 of these 4 patients after an interval of 6 months, survival-rates were normal. Gastrointestinal blood-loss was estimated by measuring radioactivity in the stools, but no relationship between melæna or anæmia and erythrocyte survival could be established. It was thought that hæmolysis

was not a significant factor in rheumatoid arthritis and was not related to anæmia or the severity of the disease.

Postmortem Studies of Movement in the Cervical Spine

Dr. J. BALL and Dr. K. A. E. MEYERS (Manchester) described an apparatus to study angular movements of the 2nd to 7th cervical vertebræ in postmortem specimens. The ranges of movement in intact spines and in specimens with successive removal of laminæ, spinous processes, ligaments, and interfacetal joints were studied. With intact adult spines movements at the first (c2–3) and sixth (c7–t1) discs were less than at other levels, peak movements being at the fourth (c5–6) disc. Removal of the posterior spinal structures resulted in progressive increase in angular mobility. The posterior longitudinal ligament and the capsules of the interfacetal joints seemed to protect the disc annulus against injury from severe flexion-extension loads, but only the interfacetal joint capsules gave protection against torsional loads.

Benign Polyarthritis

Dr. J. S. LAWRENCE (Manchester) said that during a survey of rheumatic disease in a random population sample in Leigh, Lancashire, 5% of males and 7% females gave a past history of one or more attacks of polyarthritis. 84 persons with this history were investigated, of whom 4 had evidence of rheumatic heart-disease and 23 had joint residua. The 7% incidence of positive sheep-cell agglutination reaction in the group did not differ significantly from that found in people with no previous history of polyarthritis (5%). Many cases of acute and subacute rheumatism might fall into a category of benign polyarthritis, related to the sero-negative group of inflammatory forms of polyarthritis.

Serum-cholesterol Levels in Generalised Osteoarthritis

Prof. J. H. KELLGREN, Miss J. V. HEWITT, and Dr. LAWRENCE (Manchester) had studied the relationship between serum-cholesterol levels, radiological signs of osteoarthrosis in the hands, and obesity in a random sample of 1200 people from Leigh. The incidence of all three features rose with age in both sexes, but the serum-cholesterol tended to fall in men over 60 and in women over 70, and the prevalence of obesity was also less in old age. Osteoarthrosis of the hands was commoner in the obese than in the non-obese in both sexes, and in subjects with above-average levels of serum-cholesterol. The relationship between osteoarthrosis and serum-cholesterol, however, was less apparent in the small group with serum-cholesterol levels over 360 mg. per 100 ml. The associations between serum-cholesterol and osteoarthrosis and between obesity and osteoarthrosis were greater than the rather slight association noted between obesity and serum-cholesterol.

Hæmophilic Arthropathy

Dr. J. WEBB and Dr. A. ST J. DIXON (Hammersmith) reviewed 42 patients with hæmophilia, and two-thirds had a history or signs of joint involvement. The knees, ankles, and elbows were most frequently involved, in that order, and in no instance was there any history or evidence of spinal involvement. Radiologically, a large number of different changes were found, including arrested growth lines and (apparently the most specific change) an enlargement of the radial head in those with affected elbow joints. Severe residual joint changes were often compatible with useful joint function. The presence or absence of a family history of hæmophilia did not affect the degree of arthropathy, but the level of circulating antihæmophilic globulin was important, because only patients with low levels had arthropathy.

Nail Growth in Rheumatoid Arthritis and Still's Disease

Dr. E. B. D. HAMILTON (Taplow) said that nail atrophy was common in rheumatoid arthritis. The rate of nail growth was measured in 200 patients and in normal controls, and in general the rates of growth in rheumatoid arthritis and Still's disease fell within normal range, but delay was seen in individual patients during phases of increased disease activity. Studies of the effects of anabolic steroids suggest that nail growth may provide a parameter by which to measure their effect.

Vascular Channels from Bone-marrow to Periosteum

Prof. R. G. HARRISON (Liverpool) pointed out that it was formerly thought that bone vascularisation was aided by a centripetal flow of arterial blood from periosteum to subjacent marrow, and it would have been expected that fluid introduced into the periosteum or the bone immediately subjacent to it would pass into bone at the site of injection. Experiments indicated, however, that radiopaque solutions and suspensions introduced into the compactum and well imbedded into the underlying bone were removed directly outwards, through the bone, into regional veins. Clinical observations made by Elkin, Heal, Plewes, and others had also shown that fluids introduced into the periosteum or subjacent bone passed out from the bone surface into attached muscles. It had now been demonstrated that there were vascular channels connecting the periosteum with the subjacent cortex of normal bone, and that these were venous in nature and conducted blood centrifugally into the overlying periosteal capillary bed.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

AT a meeting on Dec. 10 Prof. A. W. WILLIAMS presented a paper by Dr. A. G. SHAPER and himself on Cardiovascular Disorders at an African Hospital in Uganda.

In the less-developed tropical and subtropical regions of Africa, where many patients were admitted to hospital for infective and parasitic conditions, those with cardiovascular disorders formed a smaller proportion than they did in temperate and well-developed countries; but the proportion was growing, and, from 1955 to 1957 712 patients with cardiovascular diseases were seen at the hospital. Of these, renal hypertension accounted for 22·8%, essential hypertension for 11·4%, syphilitic aortitis for 13·6%, endomyocardial fibrosis for 13·6%, and chronic rheumatic heart-disease for 12·9%. The mortality-rate in hospital was 36% in males and 25% in females, the difference being accounted for by the far greater frequency of syphilitic aortitis in men.

Chronic nephritis and pyelonephritis were among the common disorders encountered there, and, during the three years under review 253 patients were diagnosed as suffering from it or other primary renal disorders. Of these, two-thirds presented with hypertension and many with associated heart-failure.

Syphilitic aortitis seemed to be diminishing, but it was difficult to know whether this decrease was apparent or real, for diseases such as renal hypertension and endomyocardial fibrosis were now commonly diagnosed, whereas in earlier years they were not recognised and the patient's symptoms were usually attributed to syphilis. With this reservation, it was noted that, in 1936, 56% of cardiovascular disorders at Mulago were attributed to syphilis, 20% in 1951, 17% in 1953, and 12·5% in 1955–57. Even so, the incidence was much greater than the 3% of organic cardiovascular disease attributed to syphilis in England.

Bacterial endocarditis unassociated with chronic rheumatic heart-disease was comparatively rare, as also was classical rheumatic fever, but chronic rheumatic heart-disease was common.

Much of the work on endomyocardial fibrosis has been pioneered at Mulago, where it accounts for approximately 14% of all admissions to the hospital for cardiovascular disease. Professor Williams said that of every 10 patients with endomyocardial fibrosis confirmed at necropsy, 3 presented with heart-failure without other distinguishing features, 3 with mitral incompetence only, 1 with tricuspid incompetence only, 1 with combined mitral and tricuspid incompetence, and 1 with

pericardial effusion and with obliterative fibrosis of the right ventricle. Although there were many points of similarity between endomyocardial fibrosis and rheumatic heart-disease, neither pure mitral stenosis nor involvement of the aortic valve occurred in endomyocardial fibrosis.

Angina pectoris and myocardial infarction due to coronary-artery disease were extremely rare in Africans in Uganda, but were common in the local Asian population.

In the discussion, Prof. J. McMICHAEL remarked that the contrast between the patterns of heart-disease in Uganda and in Great Britain was provocative. The high incidence of renal hypertension in Uganda was of special interest in that ideas concerning the causation of hypertension in Britain were changing and the disease here was also increasingly found to be of renal origin. Concerning the low incidence of coronary-artery disease among Africans, it was possible that the difference in age structure of populations in Africa and temperate regions might account for the difference in incidence; it was also possible that the demonstrated differences in adrenocortical function might be concerned in the discrepancy. The problems concerning cardiovascular disease in general, and endomyocardial fibrosis in particular, among Africans were urgent and exciting, and in Kampala there were the necessary background facilities for their study. It was, therefore, important to give adequate support to investigators going there to work on these questions.

Dr. H. C. TROWELL referred particularly to the difference in incidence between Africans and Europeans of certain non-infective diseases, including multiple sclerosis, thyrotoxicosis, and cholelithiasis, all of which were infrequent in Africans. The sites of cancer in Africans were different from those in Europeans. Yet among those of African descent now living in America, still further differences in the incidences of these conditions were found. Biochemical and hormonal differences, as well as environment, were probably playing a part in these variations and posed important and fascinating probems.

Reviews of Books

Doctors' Commons

A Short History of the British Medical Association. PAUL VAUGHAN. London: Heinemann. 1959. Pp. 254. 18*s*.

Charles Hastings was endowed with remarkable prescience, but it is unlikely that when, in July, 1832, he addressed a gathering of 50 local medical notables at Worcester Infirmary, even he foresaw that the society founded then would one day have a membership exceeding 70,000, or that it would become the most influential body of professional opinion in the United Kingdom.

This book recounts the steps by which the "Provincial Medical and Surgical Association" has become the British Medical Association of today, and explains, for the benefit of the layman, its constitution and its objects. But much of it will be as novel to the doctor as to his patient. (How many members of the Association know that Gounod wrote an opera where the headquarters building now stands? And how many doctors who have served in the Forces realise that, eighty years ago, their duties would have included the branding of deserters and bad characters, under the left armpit, with the letters "D" and "BC" respectively?)

The chapters have been happily arranged, in that, while they are chronologically consecutive, each deals with some particular phase of the Association's activities. For some, the first half of the book will be the most interesting. In this is described the campaign against the parsimonious provisions of the Poor Law Act, under which a doctor often received only half a crown for attending a pauper during months of illness: the agitation for the reorganisation of the Army Medical Staff, with its ludicrously styled but unprivileged ranks: and the long struggle against worthless proprietary medicine of undisclosed composition.

For others the later chapters will have more appeal, recalling such matters as the controversy over Epstein's statues, and the tortuous negotiations which preceded the "appointed day" in 1948. The statues still look down upon the Strand, and a stranger is now unlikely to notice their mutilated remains, let alone credit that they once provoked a nationwide dispute. The National Health Service is already part of the B.M.A.'s history—a history that is still being written.

Recent Neurological Research

Editor: A. BIEMOND, professor of neurology, University of Amsterdam. Amsterdam: Elsevier Publishing Co. London: D. Van Nostrand Co. 1959. Pp. 330. 47*s*. 6*d*.

THIS commemorative volume for the 50th anniversary of the Amsterdam Neurological Society covers an impressive range and is an assurance of the vitality of the society and its members. Contributions vary from the strictly clinical to the purely scientific, and equally from the largely speculative to the rigidly factual. The clinical subjects include the "Mills syndrome" of ascending spinal paralysis, diabetic myelopathy, and the inter-relations of epilepsy and cerebral tumour. Experimental contributions include a study of Echo-virus encephalitis, the histopathogenesis of oligodendrogliomas, and a comparison of the fibre tracts of the elephant and certain ungulates. On the more speculative side van Valkenberg discusses the neurology of consciousness, Bok speculates on the possible functions of the special brain vacuoles revealed by electron microscopy amongst cortical nerve fibres. Among the factual articles, Drooglever Fortuyn gives an excellent brief note on the rhinencephalic components of the dorsal thalamus; and Schenk bridges the gap between theory and fact in making the important point that characteristic memory defects still arise in a case with hippocampal-mammilary defect even with no cortical lesion.

These samples are enough to show that the book will be of interest to neurologists of all persuasions.

Mitral Valvulotomy

HAROLD J. STEWART, M.D., professor of clinical medicine, Cornell University Medical College; FRANK GLENN, M.D., Lewis Atterbury Stimson professor of surgery (chairman), Cornell University Medical College, New York. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications, 1959. Pp. 244. 80*s*.

THE accumulated experience of many years' practice of mitral valvotomy has been recorded in numerous papers, and the bibliography in this book runs to 12 pages. The volume analyses in great detail 300 patients submitted to this operation and adds another account of this work. The three main sections describe the experience in the first 100 patients, in the second and third 100, and, finally, a follow-up of the first 100 averaging four years. No reference is made in the text to the papers listed in the bibliography.

The Security of Infants (Toronto: Toronto University Press. London: Oxford University Press. 1959. Pp. 134. 28*s*.).—This book, by Betty M. Flint, senior research associate, Institute of Child Study, Toronto, is in the nature of an interim report, documenting the attempt of the Institute to construct a scale by which the mental health of infants may be measured. The theoretical framework is the security theory of Blatz. The data is presented modestly and will be of great interest and some usefulness to workers in this subject. The non-research-worker will be fascinated by the general thesis of the book but will not find any comprehensive discussion of the whole subject implied in the title.

Diseases of the Nose, Throat and Ear (7th ed. Edinburgh: E. & S. Livingstone. 1959. Pp. 467. 21*s*.)—Seven editions and two reprintings within twelve years are adequate testimony to the popularity of Mr. I. Simson Hall's book. It covers all the main points of the specialty, and the new edition is well up to date, with several new illustrations. The original concise form has been preserved, and this attractively produced handbook will continue to do valuable service.

Synopsis of Ear, Nose, and Throat Diseases.—The English publishers of this book, reviewed in our issue of Dec. 19, are Henry Kimpton.

THE LANCET

LONDON 26 DECEMBER 1959

Staying at School

IN March, 1956, the Minister of Education asked the Central Advisory Council for Education to advise him on the education of boys and girls between 15 and 18 years of age. The report [1] just published is the result of more than three years' work, under the chairmanship of Sir GEOFFREY CROWTHER, by more than thirty members of the Council, including headmasters, university dons, education officers, and prominent industrialists. They were invited " to consider, in relation to the changing social and industrial needs of our society, and the needs of its individual citizens, the education of boys and girls between 15 and 18, and in particular to consider the balance at various levels of general and specialised studies between these ages and to examine the inter-relationships of the various stages of education ". To this immense task was added, in 1957, a further request from the Minister to give the Council's views on the place of examinations below the level of that for the General Certificate of Education in the education of boys and girls between 15 and 18. Volume I of the report addresses itself to these matters, and after an exceptionally able analysis of some of the problems goes forward to make certain proposals which could change the pattern of education in this country in the next two decades. Unhappily volume II, which gives particulars of three surveys sponsored by the Council, will not be ready till the New Year. Until it appears, one cannot fully assess the value of the evidence from these surveys, referred to as the " social survey " (undertaken through the Central Office of Information), the " National Service survey " (War Office and Air Ministry), and the " technical courses survey " (231 technical colleges).

This massive report makes disturbing revelations about the present state of education and the wastage of potential brain-power in a technological age. That we should lag so far behind many neighbouring countries is a standing reproach. Of the 1·7 million boys and girls of 15 to 18 in this country only a quarter are getting full-time education; at 17 the figure drops to an eighth. Only 22% of boys and 6% of girls receive part-time education at present. Only 6% are going on to universities. The situation will rapidly become more complex, for by 1965 the number in this age-group will increase by another 30%. So difficult are the many problems that the Council recommends a twenty-year programme planned with as much care and thought as that for the development of atomic energy. The most important proposals are:

(i) Raising the school-leaving age from 15 to 16 within the next eight to ten years. (The arguments for this, based on the needs of the individual and on national requirements, are overwhelming.)

(ii) Compulsory part-time education in county colleges for all 16- to 17-year-olds who are not having full-time education. (This is to be brought about in three stages by the 1970s. It is given a lower priority than the first proposal because there is relatively little experience of how this can best be achieved.)

(iii) Establishing a " coherent national system of practical education " from the present varied collection of plans for vocational training.

(iv) Closer integration between schools and further education.

(v) Avoidance of too early or too narrow specialisation in grammar schools.

(vi) Proposals to remedy the serious shortage of teachers.

The report states bluntly that " almost the first step should be to review the provision for statistics and research ", and continues: " There are the most extraordinary gaps in our knowledge of what goes on in the schools and technical colleges we have to-day, let alone in the minds of their pupils." It examines the question of costs in considerable detail, both as direct demands falling upon the Treasury and in terms of loss of production resulting from delayed entry into industry. (But even at the cost of £250 million a year, the report concludes, the country would gain immensely in the long run.) Raising the school-leaving age, reducing the size of classes, and improving staff ratios all create a large demand for more teachers, and an energetic campaign is needed immediately to attract more and better teachers. The report recognises the special contribution of married women working part-time, and it recommends that further steps to recruit teachers should be considered, as a matter of urgency, by the National Advisory Council.

Some of the other difficulties are clearly seen. " Each extension of the school-leaving age obviously brings the schools increasingly difficult emotional and social problems." Some experienced teachers fear the results of keeping for an extra year that minority of 15-year-olds who for one reason or another have no wish to remain at school. They could obviously be a disturbing influence and hamper the work done in what, for the rest, would be the most valuable educational year so far. For this reason the chairman and eight colleagues thought that those whose interests could not best be served by keeping them compulsorily in full-time education should be permitted to take up work and maintain part-time education under the control of the local authority. Another difficulty, seen clearly by the Council, arises from the changing attitudes towards personal behaviour, values, and ethical concepts. Juvenile delinquency, divorce, and illegitimacy have emphasised the need for understanding the forces that shape teenage opinions and for a real effort to help young people to reach full maturity. The Council are very far from being able to suggest a practical solution. The " county college " is regarded as " a bridge to the future " and here it is planned to place (perhaps twenty years away) much of the education for living. Beyond acknowledging the need for a frank and full treatment

1. 15 to 18. Report of the Central Advisory Council for Education—England. Vol. I. H.M. Stationery Office. Pp. 520. 12*s*. 6*d*.

of ethical problems there is very little attempt to indicate how this education will be accomplished, and the report fails to grapple with the problem realistically. References to " all that April weather of the soul which marks the time of adolescence " and " when the strong winds of sexual attraction begin to ruffle the relatively placid waters of pre-adolescent companionship " may seem to be taking refuge in mere words. There are grounds for thinking that these matters need to be tackled with a much greater sense of urgency than the report conveys.

The section on the sixth form is stimulating and realistic. It emphasises the value of maintaining a close link between school and university, even though many sixth-formers will not eventually advance to this stage. Specialisation in sixth forms is accepted, and there are some stimulating suggestions on how time not spent on special subjects could be used for the purposes of more general education. The need for the scientist to be literate has long been urged, and the report points to the corresponding need for the arts man to be numerate —to be able, that is, to reason quantitatively and to have some understanding of scientific method and some acquaintance with the achievements of science. Only by vigorous pursuit of these aims will it be possible to prevent a serious breakdown in the communication of ideas—a breakdown that is almost upon us.

The Crowther report is one of the most important documents on education ever written; but even if the recommendations are accepted they will take a long time to materialise. One reason is the extraordinary complacency that has hampered education in this country. And this despite almost daily evidence for the past ten years that Britain is being left behind in the technological race. Improvement will cost a lot of money and there will be some who will grudge the cost. But the Government would do very wrong to set aside this report as some other controversial reports have been set aside—as too difficult or too hot to handle effectively.

Ulcerative Colitis and Cancer

CLINICAL observation with careful annotation is today less fashionable than other forms of clinical research; but its continuing value has been demonstrated by the gradual revelation over the past ten years of the association of carcinoma with ulcerative colitis. No more than ten years ago FELSEN and WOLARSKY,[1] after finding not a single case of carcinoma in 855 cases of ulcerative colitis, concluded that this complication developed independently owing to pre-existing adenomas, though BARGEN[2] had sounded the tocsin two decades earlier by reporting malignancy in 20 cases of ulcerative colitis seen at the Mayo Clinic between 1916 and 1927 (2 of these had lymphosarcoma—a surprising finding which others, too, have reported). The first clue to the explanation of this discrepancy in observation came from CATTELL,[3] who found that in cases he had operated on the overall incidence of carcinoma was 7%, but of those who had had the disease for nine years or more before operation malignant change developed in a third. The importance of long duration of the disease was subsequently emphasised differently by COUNSELL and DUKES,[4] who studied 63 specimens of colon from patients with ulcerative colitis and found cancer in 13: neoplasia was found in almost half the cases where ulcerative colitis had been present for more than ten years. These workers made the important new observation that the malignant lesions often display none of the usual naked-eye appearances of neoplasm in the bowel, and that malignant cells commonly lurk in strictures with no suspicious macroscopic features. SHANDS et al.[5] noted that multiple malignant foci were scattered throughout the bowel in 21 out of 40 specimens from cases of cancer associated with ulcerative colitis. Next, WECKESSER and CHINN[6] found that the incidence of cancer of the bowel was thirty times greater in their 118 cases of ulcerative colitis than in an otherwise healthy group with similar age distribution. GOLDGRABER et al.[7] capped this by showing that the death-rate from cancer of the bowel was eight times greater in patients with colitis than in a similar group with an otherwise normal bowel.

When treatment was confined to non-surgical methods, patients with chronic ulcerative colitis undoubtedly died with undiagnosed cancer; for the symptoms of a neoplasm are also those of colitis: SHANDS et al.[5] drew attention to the development of pain as the commonest symptom of malignant change; but by this they presumably meant *late* onset of pain, since ulcerative colitis itself often starts with spasmodic pain. From Stockholm come two reports[8 9] noting supervention of carcinoma when colitis had apparently settled; and the symptoms were ascribed not to cancer but to recurrence of the colitis. Radiographic investigation is less likely to result in detection of cancer than in cases where the bowel is unaffected by colitis (partly no doubt because the cancer is less often florid); but discovery of a stricture should strengthen suspicion. GOLDGRABER et al.[10] found that radiography failed to show the neoplasm in over 40% of their cases, while EDLING et al.[11] were unable to elicit any constant radiographic characteristics in 26 cases of ulcerative colitis by which the subsequent development of carcinoma might have been predicted. Likewise SLANEY and BROOKE[12] failed to detect cancer at operation in 3 out of 18 cases.

All workers have been impressed by the poor prognosis. This has been emphasised yet again by DAWSON and PRYSE-DAVIES[13] in an account of 663 cases of ulcerative colitis seen at the Gordon Hospital in the twelve years up to 1958. They reaffirm that the age of onset of cancer is younger on the average (44 years in

1. Felsen, J., Wolarsky, W. *Arch. intern. Med.* 1949, **84**, 293.
2. Bargen, J. A. *Arch. Surg.* 1928, **17**, 561.
3. Cattell, R. B. *Gastroenterology*. 1948, **10**, 63.
4. Counsell, P. B., Dukes, C. E. *Brit. J. Surg.* 1952, **39**, 485.
5. Shands, W. C., Dockerty, M. B., Bargen, J. A. *Surg. Gynec. Obstet.* 1952, **94**, 302.
6. Weckesser, E. C., Chinn, A. B. *J. Amer. med. Ass.* 1953, **152**, 905.
7. Goldgraber, M. B., Humphreys, E. M., Kirsner, J. B., Palmer, W. L. *Gastroenterology*, 1958, **34**, 840.
8. Svartz, N., Gillnäs, T. *Amer. J. dig. Dis.* 1958, **3**, 537.
9. Rosenqvist, H., Öhrling, H., Lagercrantz, R., Edling, N. *Lancet*, 1959, i, 906.
10. Goldgraber, M. B., Humphreys, E. M., Kirsner, J. B., Palmer, W. L. *Gastroenterology*, 1958, **34**, 809.
11. Edling, N. P. G., Lagercrantz, R., Rosenqvist, H. *Acta. radiol., Stockh.* 1959, **52**, 123.
12. Slaney, G., Brooke, B. N. *Lancet*, 1958, ii, 694.
13. Dawson, I. M. P., Pryse-Davies, J. *Brit. J. Surg.* 1959, **47**, 113.

19 patients) than in those without ulcerative colitis. These workers point to the difficulty of analysing small series: few centres have more than 20 or 30 adequately documented cases. To overcome this difficulty SLANEY and BROOKE [12] analysed all reports giving adequate data, together with 18 cases of their own. They found that 42 was the average age of onset of carcinoma (an average of 14 years after the onset of the disease) in contrast to 63 for cancer in the previously healthy bowel of an otherwise similar group. The five-year-survival rate was at best 18%.

Here then is an insidious and lethal complication. Small wonder that HICKEY and TIDRICK [14] declare that the time has come when the danger of carcinoma must be added to the indications for protocolectomy. ROSENQVIST et al.[9] go further in recommending colectomy as a prophylactic measure (BARGEN [15] is a notable dissenter to this view). Coming as it does from a stronghold of ileorectal anastomosis, AYLETT'S [16] statement that in a longstanding case he would now agree to removal of the whole large intestine is significant. Some indeed may wonder whether the retained rectum may be especially liable to become cancerous: for, though, as AYLETT avers, inflammatory changes sometimes subside in the rectum after anastomosis, cancer has a disconcerting habit of developing in the retained bowel when the disease has abated,[8 9] even after deflection of the fæcal stream through an ileostomy.[12]

There is a brighter side to this sombre picture. Cancer supervening on ulcerative colitis was once believed to be incurable, in the sense that no patient survived for five years. SLANEY and BROOKE [12] have now described 2 cases in which patients were alive at six and eight years after excision of the large bowel. Early operation may therefore alter the natural course of this disease. Most clinicians are now alert to the need to bring their patients speedily to operation; so the figure of 18% for five-year survival, based as it is on cases in previous decades, should improve in years to come.

14. Hickey, R. C., Tidrick, R. T. *Cancer*, 1958, **11**, 35.
15. Bargen, J. A., Sauer, W. G. *Lancet*, Oct. 17, 1959, p. 620.
16. Aylett, S. *ibid.* Nov. 14, 1959, p. 847.

Annotations

"TELEPHONE TAPPING" AND THE G.M.C.

THE recent case in which the police intercepted a telephone conversation [1] has raised a number of separate issues. They had been asked by the coroner to investigate the death of a woman, and in the course of their investigations they suggested to a woman that they should listen in to a telephone conversation between herself and the dead woman's doctor. She agreed to their listening at a switchboard in her shop while she spoke from an extension upstairs. No criminal proceedings were instituted. The dead woman, however, had left a letter intended for the G.M.C., and after the inquest the deputy coroner communicated with that body. Disciplinary action was later taken against the doctor for improper association and adultery with the patient. In collecting the relevant evidence, the solicitor to the G.M.C.—perhaps without weighing quite all the consequences—issued a subpœna requiring, among other things, the production of the transcript of the intercepted conversation. It fell to the Home Secretary to consider whether he should claim Crown privilege for the transcript, and on the advice of the Law Officers of the Crown he decided to allow its production to the Council.

In the first place, were the police justified in intercepting the telephone conversation? For centuries, it has been the rule that nobody may intercept letters without the personal warrant of the Home Secretary, and in 1937 this rule was extended to telephone conversations. The Home Secretary's warrant is given only for the purpose of detecting a major subversive or espionage activity likely to injure the national interest, or for detecting serious crime or customs frauds. In the case under review, the police did not seek authority from the Home Secretary, and in some quarters it is held that in failing to do so they flouted the Law. In defence of the police, the Home Secretary has pointed out that, with the woman's agreement, a shorthand writer listened in to one particular conversation on her own extension line. There was no interception of the public telephone system by the use of a monitoring device which records all conversations on a particular subscriber's line. As a legal defence, this may be valid; but it is disturbing to find that the police can avoid the need to ask for the Home Secretary's warrant by choosing the point where they intercept the conversation.

The second question is whether the transcript should have been handed to the General Medical Council. The Committee of Privy Councillors, under the chairmanship of Lord Birkett, who reported on the interception of the communications following the Marrinan case recommended that material obtained by interception should in no circumstances be made available to anyone outside the public service. It held that a former Home Secretary had acted wrongly in disclosing such material to the Bar Council even though he was satisfied that the conduct of the barrister in question struck at the very heart of the administration of justice. Even if it be argued that in the present case there was technically no "interception", the disclosure to the General Medical Council scarcely seems to accord with the spirit of the Birkett report. Moreover, however deplorable the doctor's adultery, it was not even the matter which the police had been asked to investigate.

The present controversy has also raised the question whether the General Medical Council and similar disciplinary bodies should have the power of the subpœna, and the Government have promised an inquiry "to what extent and subject to what conditions subpoenas . . . should be issuable . . ." The inquiry is particularly pertinent in view of the proposal to establish some new disciplinary tribunals under the Professions Supplementary to Medicine Bill. In some of the press comment, disciplinary tribunals of this kind have been referred to as "private" bodies, and there has even been a suggestion that the ordinary citizen should not be subject to the inconvenience of being summoned to give evidence before such bodies. But it must be remembered that these tribunals are charged by statute with important functions intended for the protection of the public. In the discharge of these functions, the tribunal must have reasonable powers of finding the truth, in the interests of the public, the profession, and the accused man alike.

1. See Parliamentary report on p. 1191 and letter on p. 1190; also *Lancet*, Dec. 12, 1959, p. 1082.

THE GLOMERULUS AND THE ELECTRON MICROSCOPE

OUR knowledge of the structure of the glomerulus has been extended by electron-microscope studies which have shown that there are three main components: epithelial cells, basement membrane, and vascular endothelial cells.[1] Controversy is raging round what may seem a relatively minor point, whether there is also any connective tissue beyond the hilum; and this is relevant to our conception of how disease may affect the glomerulus —whether lesions must be either extracapillary (epithelial) or intracapillary (endothelial) or whether they may also be intercapillary (connective tissue).

Jones [2] claims that the basement membrane is double, with a thick lamina densa related to the epithelial cells and a thinner lamina fenestrata related to the endothelial cells; and that this basement membrane is a connective-tissue structure divided by spaces in parts of which are connective-tissue cells—the mesangial cells of Zimmermann.[3] He claims that in secondary amyloidosis the amyloid is deposited between the membranes, and also that fluid collects in the connective-tissue spaces in eclampsia gravidarum: he cites an analogy with the lung alveoli; and others [4] have used the analogy of a sling—e.g., the peritoneum and small intestine. All working on the structure of the normal glomerulus agree that there are no formed collagen or reticular fibres except at the hilum. Most, however, accept that there is only one basement membrane,[5] anyhow at the periphery, though towards the hilum there is a conglomeration of cells about which some doubt exists. In this region, in addition to the three main components, there have been described "intercapillary" [6] or "third" [3 7] cells and an intercapillary space [8] believed to be of connective tissue; the whole mass of cells in the hilum has been called "endenchyma".[9] Mueller [5 10] does not admit that there are any connective-tissue spaces or cells and postulates that the axial stalk consists of a syncytium of endothelial cells, the peripheral parts hollowed out into capillary lumens and the central part containing the nuclei and most of the cytoplasm: he believes that the "third" cell is an endothelial cell whose lumen is in a plane above or below that of the section.

Kurtz and McManus [11] now support Mueller and produce a powerful argument to show that the generally accepted conception of the development of the glomerulus as an invagination of capillary loops into the spherical vesicle at the blind end of the nephric tubule [12] is wrong. They declare that there has always been a school of opposition to this conception, and that now electron-miscrocope studies in the developing rat [13] and in the human fœtus [14] reinforce this opposition: differentiation occurs in solid masses of cells making up the primitive tubule arranged concentrically round a central cell mass of primitive endothelial cells; the layer of tubule cells next to the central mass becomes the visceral cells of Bowman's capsule, different in shape from the outer cells, and thereafter clefts appear and form the capsular space; the visceral layer of epithelial cells takes an active part in shaping the glomerulus, and foot processes are seen early, deep in the interstices of the primitive tuft; red blood-cells are found before capillary lumens develop by vesicle formations in the endothelial cell mass and subsequent fusion; and the basement membrane appears only in areas where epithelial and endothelial cells are in contact, suggesting a joint origin. Kurtz and McManus maintain that the basement membrane is continuous round several capillaries, and only rarely and at the periphery of lobules is it found to encircle completely one capillary: often, and especially towards the stalk of the tuft, the basement membrane contains several cells which are unrelated to capillary lumens—cells which are denser than those lining a lumen. Kurtz and McManus suggest that these cells, in accordance with the theory of development, should be called "interluminal cell aggregates" or "axial endothelial cells" and should be recognised as distinctive, as they may be associated with specific lesions.[15] Most emphasis has so far been placed on electron-microscopic study of normal and developing glomeruli, and it will be interesting to observe how this conception agrees with further studies on pathological glomeruli.

BACTERIAL ENDOCARDITIS

SINCE the successful introduction of penicillin in 1944,[16] bacterial endocarditis has rightly been regarded as curable; but, as Wedgwood [17] emphasised, there are no grounds for complacency, for 1 out of every 3 or 4 afflicted still dies, and the infection before being eradicated may cause irreversible damage leading to progressive heart-failure and disability. The natural history of the disease has thus changed considerably, and an analysis by Morgan and Bland [18] of 228 cases seen at the Massachustts General Hospital since 1944 is particularly welcome.

Acute bacterial endocarditis in their experience remains a lethal disease, for only 8 out of 53 patients survived. This is not entirely surprising, since acute bacterial endocarditis is usually part of an overwhelming septicæmia from a primary infection elsewhere (pneumonia and meningitis, for example) and often remains unsuspected during life. Thus the diagnosis was not made until necropsy in 32 of these 53 patients; and, of the remaining 21, 8 died before treatment could be effective. Staphylococci and pneumococci were the commonest organisms. Massive doses of penicillin are needed once the diagnosis is suspected: in staphylococcal infections one of the newer antibiotics, such as vancomycin, may be required in combination with penicillin. In acute bacterial endocarditis the mortality-rate is apparently 50–75% despite treatment. [19 20]

The immediate mortality from subacute bacterial endocarditis now lies between 25 and 35% [21]; and in this country Cates and Christie [22] found that 300 (76%) out of

1. *Lancet*, 1957, ii, 1324.
2. Jones, D. B. *in* R. C. Mellors' Analytical Pathology (edited by R. C. Mellors); p. 169. New York, 1957.
3. Zimmermann, K. W. *Z. mikro.-anat. Forsch.* 1933, **32**, 176.
4. Allen, A. C. The Kidney: Medical and Surgical Diseases. London, 1951.
5. Mueller, C. B. *Amer. Heart J.* 1958, **55**, 304.
6. Yamada, E. *J. biophys. biochem. Cytol.* 1955, **1**, 551.
7. McManus, J. F. A. *Amer. J. Path.* 1948, **24**, 1259.
8. Kimmelstiel, P., Wilson, C. *ibid.* 1936, **12**, 83.
9. Elias, A. H. Cited by C. B. Mueller (footnote 5).
10. Mueller, C. B., Mason, A. D., Jr., Stout, D. G. *Amer. J. Med.* 1955, **18**, 267.
11. Kurtz, S. M., McManus, J. F. A. *Amer. Heart J.* 1959, **58**, 357.
12. Maximow, A. A., Bloom, W. Textbook of Histology. London, 1949.
13. Hall, B. V. Proceedings of the Sixth Annual Conference on Nephrotic Syndrome, N.Y., 1954, p. 1. Hall, B. V., Roth, E. Proceedings of the Stockholm Conference on Electron Microscopy, N.Y., 1957, p. 176.
14. Kurtz, S. M. *Exp. Cell Res.* 1958, **14**, 355.
15. McManus, J. F. A. Medical Diseases of the Kidney. Philadelphia, 1950.
16. Loewe, L., Rosenblatt, P., Greene, H. J , Russell, M. *J. Amer. med. Ass.* 1944, **124**, 144.
17. Wedgwood, J. *Lancet*, 1957, ii, 922.
18. Morgan, W. L., Bland, E. F. *Circulation*, 1959, **19**, 753.
19. Fisher, A. M., Wagner, H. N., Jr., Ross, R. S. *Arch. intern. Med.* 1955, **95**, 427.
20. Shubin, H., Levinson, D. C., Griffith, G. C. *J. Amer. med. Ass.* 1958, **167**, 1218.
21. Friedberg, C. K. *ibid.* 1950, **144**, 527.
22. Cates, J. E., Christie, R. V. *Quart. J. Med.* 1951, **20**, 93.

408 patients with positive blood-cultures were alive one month after treatment was stopped. Morgan and Bland report a survival-rate of 68%; but in 25 of the 56 patients who died the diagnosis was made only at necropsy, so the survival amongst those treated was 79%. Of the 119 survivors 50 have died in the ten-year follow-up period, congestive cardiac failure being the commonest cause (21); altogether 42 of the survivors were in cardiac failure at some time subsequently. The liability to failure is due to the added valve damage and distortion, which was invariably found at necropsy, and also to the widespread myocardial damage which occurs in many cases.[23 24]

Perforation of a valve cusp—a recognised hazard of bacterial endocarditis—occurred in 8 patients, although the onset in 4 seemed to be some months after successful treatment. It is nearly always followed by progressive failure, and may be suspected when failure supervenes soon after the sudden appearance of a new and loud murmur. A less common complication is aneurysm of the mitral valve, which developed in 2 patients, both of whom died. According to Saphir and Leroy,[25] true mitral-valve aneurysms (as opposed to those consisting merely of a hollow mass of thrombus) are much commoner since the advent of antibiotics because their development depends on some degree of healing. These aneurysms at first obstruct the mitral orifice, but may later rupture causing incompetence and failure. Previous experience [26 27] has suggested that subacute bacterial endocarditis is particularly liable to aggravate existing aortic-valve damage, causing severe incompetence and often angina pectoris. In the Massachusetts series 8 survivors were left with gross aortic incompetence, and 4 of these died suddenly. The risk of embolism persists for an undetermined period after apparent cure, and it has been detected as long as seventy days after treatment [22]: late embolism was observed in 9 cases by Morgan and Bland, while an iliac mycotic aneurysm was discovered and excised in another patient nine months after cure of the disease. Cates and Christie [7] have recorded rupture of an unsuspected cerebral mycotic aneurysm twenty-two months later. By contrast early treatment with antibiotics seems considerably to diminish the risk of renal failure, and the incidence of 4% in the Massachusetts series compares favourably with the 14% reported by Bell [28] in 1932. 10 patients had a recurrence of bacterial endocarditis, the longest interval after the original infection being ten years, and all except 2, in whom the reinfection was due to *Staphylococcus aureus*, survived after further treatment.

The experience of Morgan and Bland confirms the uncertainty of the prognosis after bacterial endocarditis has been cured. Once vegetations are established they are almost certain to cause some valvular or myocardial damage, and paradoxically their healing may lead to further distortion. Early diagnosis and prompt treatment will minimise the damage, but unfortunately the diagnosis cannot be made until the infection is already established on the valves. Prevention must be the aim; and, whilst not all cases follow dental extraction or catheterisation, some still do so. In view of the difficulty in deciding whether a systolic murmur is innocent or not, it might be wise to provide penicillin cover for anyone with a cardiac murmur who is to undergo any operation.

23. Saphir, O., Katz, L. N., Gore, I. *Circulation*, 1950, **1**, 1155.
24. Correll, H. L., Lubitz, J. M., Lindert, M. C. F. *Ann. intern. Med.* 1951, **35**, 45.
25. Saphir, O., Leroy, E. P. *Amer. J. Path.* 1948, **24**, 83.
26. Kaplan, S. R., Rosenman, R. H., Katz, L. N., Brams, W. *J. Amer. med. Ass.* 1949, **141**, 114.
27. Hall, B. *Ann. intern. Med.* 1957, **47**, 880.
28. Bell, E. T. *Amer. J. Path.* 1932, **8**, 639.

TELEVISION HAZARDS

MANY people spend hours each week, immobile and passive, before the television screen. Bronte-Stewart,[1] reviewing the factors that may have a bearing on ischæmic heart-disease, suggests that posture may influence the distribution and severity of atheromatous deposits. He cites Stewart,[2] who named the slouching position adopted in an easy chair in explanation of the common atheromatous lesion about 1·5 cm. from the origin of the left coronary artery. The pressure exerted by the abdominal contents on the posterior part of the diaphragm would be transmitted to the heart and kink it forwards—a distortion which, if prolonged and frequent enough, might be supposed to foster atheroma at this site. Several forms of acute "television collapse" are now recognised. Simple faints are not unusual when surgical procedures are illustrated; and Rose [3] points out that true angina pectoris can be provoked by some programmes: members of our society, often indulging little in physical activity, have found different occasions for the stimulation of cardiac output. Maxwell [4] found that, of five patients who had collapsed with substernal pain and shock while they were viewing, three had hiatus herniæ: each had eaten a heavy meal before the attack, and had then sat in a low chair. Prolonged immobility in awkward posture entails also a risk of venous thrombosis.[5] Naide,[6] having seen three cases in which thrombosis developed while the patients were watching television (two subsequently had pulmonary embolism), recommends that viewers should move out of their chairs at least once an hour, and he cautions against the wearing of constricting garments, such as tight girdles, during long-continued viewing. (This is not the only circumstance in which lengthy immobility may result in venous disorders: Nareff [7] has described 8 cases of "passenger phlebitis" in those who had travelled by air.) "Television neck" is a further condition that can be ascribed to unsatisfactory posture: it consists in cervical pain and stiffness after watching from a chair of the wrong height.

Television may occasionally be responsible for the manifestation of otherwise latent conditions. Martin [8] inferred that the combination of a darkened room and the necessity for accommodation might have precipitated glaucoma in an old lady who watched the full Coronation programme on her newly acquired set. Flickering of the apparatus has been known to initiate a fit in a susceptible epileptic. Furthermore, Hay [9] described a schizophrenic patient who manifested command-automatism during commercial programmes: an invocation to use a certain hair tonic, accompanied by a demonstration, resulted in the patient scooping water from a nearby gold-fish bowl and applying it to his hair.

Like most human inactivities, television is not devoid of hazard; but the hazard is small, and should not be exaggerated. Yudkin,[10] after analysing the relation of the incidence of ischæmic heart-disease to many different aspects of diet, found that the closest relation was with the number of radio and television licences. But the correlation with the number of registered motor-vehicles was hardly less close.

1. Bronte-Stewart, B. *Postgrad. med. J.* 1959, **35**, 183.
2. Stewart, I. *Brit. med. J.* 1957, ii. 237.
3. Rose, G. A. *ibid.* 1959, i, 506.
4. Maxwell, J. *ibid.* p. 1352.
5. *Lancet*, 1957, ii, 994.
6. Naide, M. *J. Amer. med. Ass.* 1957, **165**, 681.
7. Nareff, M. J. *Aerospace Med.* 1959, **30**, 791.
8. Martin, V. A. F. *Brit. med. J.* 1953, ii, 98.
9. Hay, C. *Amer. J. Psychiat.* 1955, **112**, 65.
10. Yudkin, J. *Lancet*, 1957, ii, 155.

Special Articles

THE MEDICAL ARCHIVES OF RATTIONALIA

RUTH STRAUS *

ACCIDENTALLY separated from the jet plane that was carrying him home from the International Congress of Tonsilology, Dr. Lemuel Gulliver VIII landed by heredofamilial good fortune in Rattionalia, the country of the laboratory rat.

During the first hours after his arrival, he gave himself up to impending death. He was told that human beings had been used as laboratory subjects by early Rattionalian investigators: they had been dispensed with only because their nervous and psychic responses lagged behind those of rational animals, and because they refused to breed true. Dr. Gulliver's dexterity with the laryngoscope (he had thought to excite his captors' awe by exhibiting that instrument) and the evident purity of his lineage roused the avidity of the scientists to whom he had been consigned. Only when he chanced to mention that he was the author of numerous publications in his field, and an associate editor of *Throat*, was his demise postponed.

"In that case," the neuropsychiatrist who was examining him reluctantly conceded, "you are in Dr. Whisk's jurisdiction."

"And who is Dr. Whisk?" asked Gulliver bravely.

"Dr. Whisk is Chief of the Word. It is he who decides the destiny of medical authors."

On the morning of Feb. 30, Dr. Gulliver mounted the plastic ramparts to the office of the President of the National Scientific Archives with profound apprehension. He knocked and was admitted.

Dr. Whisk was a white-whiskered rodent of calm visage, the product of 19,382 generations of inbreeding in the D-86Ar2 strain, every centimetre an aristoc rat. Appearing to defer the tasks of justice, he implied that he was Gulliver's host. Within minutes, Gulliver was disarmed, not only by Dr. Whisk's benign manner but also by the splendour of what he saw. The archivist escorted him, through a wall-to-wall carpeted maze, to the National Library of Medical Publications, explaining as they went that each metropolitan district, together with its adjacent rural area, was served by a duplicate of this institution.

Despite a wealth of evidence of a rarefied order of knowledge, the national medical library was contained within a single room. Emblazoned above its entrance was the motto, MISERERE, RATTE, SILVARUM. About a hundred librarians answered hushed telephones, sought volumes in stacks, and placed them opened under wire-photo machines. Dr. Gulliver looked in vain for a reader's room.

"No doctors?" he asked.

"Heavens, no! We couldn't afford interruptions, the chance of loss, damage . . ." Dr. Whisk nodded toward the switchboard. "Every physician and surgeon in Rattionalia A has a direct wire from his office to that board. In our technical journals, each published article is accompanied by a card of standard size and format, on which the article is summarised. The card is both punched for electronic sorting and printed with a code for hand filing. In the national libraries the cards are filed electronically; most physicians, in their offices, use the hand system. For a nominal fee, one may subscribe to the summary cards alone. Within minutes after a physician calls this room, he receives through the direct wire-photo a facsimile of the article he requests. He may have copies of the entire literature on a given subject within a half-day."

"I read once," Gulliver commented sceptically, "that the cost of a system like this for a country with the scientific output of the United States of America would be prohibitive. I suppose for a small nation like yours . . ."

"The source of this disparity," the rat assured him quietly, "is not the relative sizes of our countries." He added with a dry smile: "The administrators were somewhat recalcitrant about the initial cost; but the maintenance expense is a fraction of that drained into dozens of inadequate libraries in hospitals and medical society offices under the old system. But tell me," he asked, "do your doctors still drudge from office to library, from index to index, in medieval acquiescence to senseless labour?"

Ignoring the query, Gulliver sauntered about. His hand itched to remove a volume from the shelves, but he had been warned not to touch the books. Dr. Whisk beckoned to a librarian, who sped to their side and with barely masked reluctance handed them a four-year-old copy of the *Journal of the Rattionalian Medical Society*. The first article began and ended abruptly:

Hwvr, stxrla appr to be snthszd in ncls of lambda cls. Rtio cytplsm:ncls consistntly 1:1. Spcfc actvty $Stxrla^{911}$ in cytplsm excds that in cl wll; hnc cytplsm stxrla not from cl wll. *Method:* $Stxrla^{911}$, M862Kt.

Dr. Gulliver blinked. "That's the article?"

"An important contribution in its time," Dr. Whisk assured him.

"A bit succinct, isn't it?"

"It was all he had to say that hadn't been published before." The rat inclined his head reverently toward the motto above the doorway.

Back in Dr. Whisk's office, Gulliver seated himself on the floor. Loyalty to home and species, and to his somewhat humble subspecialty, the human tonsil, forbade that he confess his uneasiness. Dr. Whisk seemed to discern the reason for his silence.

"To know a field well," he told Gulliver gently, "one need not rely on endless repetition. Indeed, when the reasoning psyche is assailed by repetition, it reacts with doubt. The most efficient way to fix a fact in memory is to see and hear it demonstrated once, adequately, within its context; then to apply it.

"Our literature," he went on, "is a formalised conversation between investigators and clinicians. Each of our textbooks is a compendious review including three facets of the given subject: the totality of proved data, the comments of all authorities in the field on moot points, and the questions to which answers are currently sought. These are our baseline publications. Manuals teaching their use are employed in the medical schools. One text in each specialty and subspecialty is issued every five years. During the interim, none may appear.

"Our technical journals are edited by the same bodies of rats that edit the texts. Rotation of editors from clinical and investigative fields assures both freshness of approach and continuity of method. The total literature may be read as a single unified article."

Gulliver recalled the awe in which Dr. Whisk was held. "You originated this idea, I suppose?"

"By no means single-handed. It evolved as a product of many minds. Although three-quarters of our editors are specialists in clinical and investigative fields, one-quarter are physicians specialising in medical communication. Being as zealous for advance in their skill as are radiologists or surgeons, these specialists constantly improve the means of communication."

"I suppose all this terseness and smoothness and so on speed your investigative work?"

"Considerably."

Gulliver's mind raced to encompass a vision of illimitable acceleration. "How do you, as publisher, keep up the pace?"

"When material is presented to the editor in this style, publication is simple and swift. Underlying the product that

* From the Department of Publications, Kaiser Foundation Hospitals, Oakland, 11, California, U.S.A.

u see, Dr. Gulliver, is a basic principle: in Rationalia, the ocess of assimilation is demanded primarily of the author. is capacity for assimilation that makes authorship kin to thority. Once that responsibility is accepted by the writer, e editor's task is as simple as his role is self-effacing." dulging his enthusiasm, Dr. Whisk added, " These principles ve us well. You, for example, although a newcomer, could rn from our literature all that we know about the tonsil thin a month."

Gulliver got up and prowled about. The ceiling was lofty Rattionalian standards, but he found it oppressively low.

" The whole thing's too damned inhuman," he grated. " I'd ss the old, comfortable puddle. You can say all you like out facts *versus* opinion, but when I see a necrotic tonsil, I nt to know more about what a first-rate doctor *thinks* than out what some 'teenager in a lab *knows*."

The first-rate Rattionalian nodded. " We have, of course, nother type of publication—' whipped cream ', we call such—herein the writer may divest himself of his emotional load d the reader may obtain vicariously a similar relief. We have pe recordings, too; closed-circuit television, motion pictures, rbatim transcripts of Boston bull sessions—all these have a rtain value. But we do not confuse them with scientific ports, and we do not index them."

Gulliver hunched on the carpet to ease his neck, and scowled. How do I know that the author of that article used proper ntrols ?" he challenged.

" An excellent point." Dr. Whisk placed the tips of his paws gether in a gesture used by pedants the world over. " We cided decades ago that ascertaining the reliability of an vestigation is the function not of the reader of a scientific port (who cannot absolutely determine this in any event) but the institution under whose auspices the work is done. olleagues from the author's university or hospital scrutinise is methods and results. A board of specialists from another stitution, selected by an electronic straw-drawer which practically eliminates the probability of bias, review each investigator's work. Thus, as far as rattily possible, we have evidence validity before committing a statement to print."

Dr. Whisk punctured his epidermis lightly and brushed on drop of tranquilliser-stimulator with a gentle, stroking assage—a civilised equivalent of smoking, which Gulliver ad considered but had rejected because it might form a habit e would be unable either to continue or to forget after his turn.

" How about the medical schools ? " he asked suddenly. " Twelve authors to a paper—papers broken into subsections o make multiple publications—how do you help academic spirants satisfy faculty requirements ? "

" The medical schools have been our greatest source of help. ublication remains one criterion for promotion, but other riteria are equally valid. For example, one of our best proofs f an investigator's acumen is his refusal to publish results if e doubts their importance, no matter how much time he has pent on obtaining them."

" Well, now, it's the same with us—"

" When did you last give an official dinner—and a rise in ay—to an investigator who buried a year's intensive work in ilence ? "

" *Silence ?*"

The rat regarded him with lightly veiled amusement.

Gulliver rested his head on his hand and sighed.

" All right," he conceded at last. " You've got something. Now, how did you bring it about ? "

Dr. Whisk's black eyes twinkled reminiscently. " It all happened abruptly in the end. Back in the years 1950–1960 A.R., all but the most bedazzled of us realised that we were deep in an epidemic of the moronic plague. Our first thought was to set up a Research Programme in Technical Communications, to cost the appropriate millions." He smiled leniently and eased back in his chair. " We appropriated the money, formed a committee (I was a junior member), and started the pilot study. We had the enthusiastic backing of every scientist in Rattionalia. Then," he glanced quizzically at Gulliver, " our committee discovered that its first step must be to psychoanalyse every author who had published a paper within the last ten years, to learn hidden motivations to publication." He chuckled softly. " Now, of course the most influential rats were those that had published most. Within days, laws were passed against unnecessary verbiage in technical literature. Repetition was voted a crime. The punishment is fiendish but effective."

The black eyes twinkled again, and Gulliver's blue ones began to emulate them, but the twinkle hardened to a glint and Gulliver's smile slacked. The memory of an extensive review he had submitted within the last week to the *American Tonsil* rose to the surface of his consciousness.

" A fine, I suppose," he murmured casually.

" Imprisonment."

" You're mad!" You put a fellow in *gaol* for—"

" Not in gaol, Dr. Gulliver. We consign the repetitive writer to the medical archives of the days before the reformation. Do let me show you."

Dr. Whisk rose and conducted his captive guest to a waiting elevator. It carried them down interminably; they stepped out into blackness; and the elevator rose behind them with a hushed sigh. Dr. Whisk touched a switch. An ultraviolet light spread a ghastly colour over endless stacks of bound volumes receding into murky catacombs. The musty smell of fine leather invaded the nostrils. Gulliver touched a book and his hand recoiled. The thing was bound in human skin.

" Take down a volume," urged Dr. Whisk. " Glance through it. The old style has a certain nostalgic charm."

Stifling his loathing, Gulliver opened the first book on which his hand came, not to rest, but to quiver. An introductory paragraph looked as familiar as a scuffed doormat:

As early as 1873, it was noted that the bacterium *Styphaureomalcides botuparagraphylii* was to be found in

. . . . . .

. . . . . .

. . . . . .

However, it was not until 1911 that Murchison discovered

. . . . . .

. . . . . .

Our interest in this field was aroused when we observed by chance that

. . . . . .

Gulliver slammed the book shut. " You can't do this to me! " His scream rasped through the catacombs.

Dr. Whisk's teeth gleamed in the hideous light. " No cause for alarm," he assured Gulliver silkily. " You're not guilty, I'm sure, of such a crime as this ? "

" I swear I never—" The words stuck in Gulliver's throat. " Look here, I'm not punishable by you! I'm not a citizen of your filthy rat's nest—"

" And therefore have not a citizen's right to a court trial," grinned the rodent. " All that you have unwittingly revealed by your crude astonishment at our methods . . . your attitude of self-defence at this moment . . . these and more suggest—"

He crowded against Gulliver. The human physician overcame his revulsion against the rat by dint of his greater detestation of cowardice.

" There are things you've forgotten," he urged with forced calm. " Like being friendly to strangers. The love of humanity."

At the word " humanity ", the rat turned away and gave three short taps to the elevator button. When the car arrived it was full of rats in uniform. Each carried a weapon the size of a fountain-pen, which looked mightier than the sword. Dr. Whisk joined them with dignity and turned to face his prisoner.

" In this rational country we don't extend punishment beyond its remedial effect." He smoothed his white whiskers with a benign smile, more like a pædiatrician prescribing a tonsillectomy to a bewildered child than like the ruthless dictator of the Word. " I ask you, sir, as my guest, to spend a day and a night here. Food will be brought to you. And on the shelves, there is so much food for thought. Make yourself at home; you'll find the atmosphere familiar."

The elevator door closed. In the eerily lit archives, Gulliver

stood with the rat's last words whispering through his skull.

"Just spend your time reading, Dr. Gulliver. Reading endless repetition. Endless repetition. Just Read. Read. Read. . . ."

THE MIDDLESEX MEDICAL SCHOOL

NEW buildings for the Middlesex Hospital Medical School are being erected at a cost of about £1¾ million on a site in Cleveland Street bought for this purpose by the University Grants Committee after the war. The work is to be done in three phases, and phase 1 ended on Dec. 16 when Lord Astor of Hever (chairman both of the hospital board of governors and of the school council) unveiled a commemorative stone in the first building to be completed.

Since, as he said, the main purpose of the school is to *teach*—and the existing premises are "increasingly obsolete and inadequate"—priority has been given to a teaching block, which contains premedical and preclinical laboratories, the fine new Edward Lewis lecture theatre (seating 391), and temporary common-rooms and reading-rooms for students and staff. Despite the inconvenience of dividing departments between the old and new buildings, teaching is to begin in the new block in the New Year. Unfortunately about £½ million has still to be found, and only part of the second phase of the work can be undertaken immediately; but there is every hope that by the end of next year the remainder of the preclinical and premedical departments can be rehoused—though at first under difficulties. The third phase of the scheme is the building of the Astor College, which is to start in 1962 and should be finished two years later. This is to be a hall of residence for 180, giving collegiate life to as many of the students as possible. For this purpose Lord Astor himself gave £400,000.

In recalling the history of the school, Prof. B. W. WINDEYER, the dean, referred to its long connection with cancer research and the relatively early establishment of the Barnato-Joel physical laboratories. But, as Lord Webb-Johnson had said, its real greatness dated from the establishment of the Bland-Sutton Institute of Pathology; and what this institute had done for surgery the Courtauld Institute of Biochemistry had done for medicine. Also part of the school was the Ferens Institute, and there was close association with the Institute of Clinical Research established six years ago from hospital endowment funds. Among the school's contributions to medicine were the work on chemotherapy begun by C. H. Browning and continued by Sir Lionel Whitby's introduction of sulphapyridine, the synthesis of stilboestrol by Sir Charles Dodds, with Mr. Wilfrid Lawson and Sir Robert Robinson; and the discovery of aldosterone by Dr. and Mrs. J. F. Tait. Prof. S. Russ had been responsible for creating the British X-ray and Radium Protection Committee, first of its kind in the world. These were illustrations of the vitality and activity of the school in various stages of development. Today more than ever there was need for integration of the departments where patients were treated and the departments of basic science. There was need, too, for flexibility: for example, present-day work on steroid chemistry and on radioisotopes could not have been envisaged a few years ago.

Dr. C. F. HARRIS, vice-chancellor of the University of London, said that whenever one school of the university took a step forward it was a matter for rejoicing by all. After speaking of the imagination, foresight, and drive shown by Dr. Windeyer and his associates, he pointed out that the premedical and preclinical subjects are no longer regarded as hurdles to be forgotten as soon as surmounted. Biology, for example, concerned mankind and his visible and invisible enemies as much as it concerned the rabbit, the dogfish, and the frog. The new buildings, he felt, would meet the challenge of the future; and if the school could do what it had done in the old ones, the prospects were dazzling.

Lord ASTOR of HEVER said that he had met people who were unaffected by their surroundings: the fact that the sun never penetrated their rooms and the ceilings leaked only added brilliance to their work. But these were freaks. His hope was that the new school would encourage and facilitate new work from which great benefit would flow. When rebuilding had first been considered it seemed that the time was not ripe; but "if a thing is really necessary the right time to do it is *now*". The opening of the lecture theatre, named after its donor Mr. Edward Lewis, was in fact a matter of urgency since it was needed for a rehearsal that night.

Sir CHARLES DODDS, describing himself as the senior of all the 246 professors in the university, said that the Middlesex seemed always to have been able to make decisions rather ahead of events. This, he thought, was largely because it had been fortunate in the lay members of its boards, from the very foundation of the hospital in the 18th century. He spoke of the percipience with which members of some of the Middlesex families—the Courtaulds, the Whitbreads, the Joels, and others—had applied their gifts. But the hospital had had no greater benefactor in its history than its present chairman, who had given it so much of his time and thought and had so full an understanding of its needs and wants. He agreed with Lord Astor that it is not really necessary to have leaking roofs and broken windows in order to do good work. And, like Dr. Harris, he paid a tribute both to the foresight of the Dean and to the work he had put into it "with Antipodean furor".

THE NEW ST. THOMAS'S

THE fabric of St. Thomas's Hospital, which stands on the Thames opposite the Houses of Parliament, was so shattered by bombing that the governors are not going to be able to fulfil their intention to keep the old building. Since the Ministry of Health approved the rebuilding scheme in principle in April, detailed requirements of the first stage of the new hospital have been collated and agreed and the detailed plans have been submitted to the Ministry for formal approval. A model showing the general appearance and layout of the complete scheme has been seen by the Ministers of Housing and Local Government, Health and Works, and other authorities. It is now being shown to both Houses of Parliament. The governors have made available land for the first stage and for the diversion of Lambeth Palace Road. They are financing the construction of the new road which will be completed next autumn and the rebuilding will, it is hoped, then begin immediately.

The diversion of that part of the existing Lambeth Palace Road between Lambeth Palace and County Hall will provide a site of nearly double the present hospital area, so that the much needed expansion can take place without having the hospital divided by a main road.

The patients' accommodation will be set back about 120 yards from the river and will consist of the main ward block of basement and eleven storeys and a roof terrace (with an overall height of approximately 150 feet), linked to a parallel four-storey outpatient and theatre block. All the wards will have a clear view over a landscaped open space towards the river, and will be protected from traffic by the outpatient block which will run between it and the new Lambeth Palace Road.

The eight-storey residential blocks are placed nearer the river at either end and will be connected to the patients' accommodation by low buildings and colonnades. Provision is also made for the rebuilding of the medical school and for student residential accommodation.

The new proposals were prepared by Mr. W. Fowler Howitt, A.R.I.B.A., architect to the hospital, and envisage the rebuilding taking place in four stages.

The architects for the medical school part of the scheme are Messrs. Easton & Robertson.

Dialogues of Today

HUMAN NATURE

SOCRATES: During the past year, Eryximachus, we have been talking about many aspects of medicine, about how to deal with what is evil in the body and the mind, and how to make the good better in teaching and organisation, but there is one thing which seems to me to be fundamental to all such questions, and which we have never discussed—human nature. Do you agree that he would be a foolish workman who made designs without taking into account the quality of his material?

ERYXIMACHUS: Of course.

SOCRATES: Tell me, then, how you think the nature of man should influence us when we try to solve these problems.

ERYXIMACHUS: I have never considered that question, Socrates.

SOCRATES: Perhaps not, but I suspect that you have a view of human nature which you take for granted, even though you may not have formulated it.

ERYXIMACHUS: Well, I try to be guided by the facts. I see that few people are wise, and most need to have many things decided for them. The average man cannot be expected to do more than a simple routine job, or to spend his leisure on anything more intellectual than sport, comics, and the teleoptic. We have the forms of democracy, it is true, and on fundamental issues the great public's heart is sound, but the only effective government is an aristocracy disguised as a democracy, and that is what we have, whatever party is in power. No other alternative to tyranny will work today, and I don't think is ever likely to, human nature being what it is.

SOCRATES: You think, then, that there is little prospect that human nature will change?

ERYXIMACHUS: I see no evidence that it has changed in historical times, nor that it is changing today.

SOCRATES: Come, Theologus, you are an authority on human nature: what do you say to that?

THEOLOGUS: It would take me too long, Socrates, to tell you all that I believe about human nature, and much longer to give the reasons for the faith that is in me. But I can at least say this. I believe in original sin. You may prefer some other name for it, but the fact is that we all come into the world with inherited tendencies to evil. Religion offers the means of overcoming these, but it is always the individual who must be saved: society cannot do this for him. And since society is composed of individuals, the only way to change society is to change individuals. And I would go further than that. I do not think that we are here primarily to change society. The world is a vale of soul-making, and society, therefore, is not an end in itself, but a means to that end.

ANALYTICUS: I hope Theologus won't be offended, Socrates, if I say that his ideas are two thousand years out of date. They are the product of the only philosophy and psychology that were possible when they were formulated, but today we can no longer accept his distinction between the individual and society. The individual personality is partly the embodiment of inherited mental patterns, but it is also the result of the interplay between these and society, which begins with his mother's breast and his infantile training, and continues with the rest of his family, his friends, school, work, social conventions, and the laws of his country. All these having combined to make him what he is, to give him his impulses, his ideas, and his inhibitions—his id, his ego, and his superego, if you like—it is absurd to isolate him from society in thought, and say that he is individually responsible not only for his own soul, but also for the fate of society. If the individual, being part of society, is responsible for society, society, which includes the individual, is responsible for him. Neither is prior to the other, and to suppose so is to succumb to a semantic error.

ENTHUSIASTICUS: I must disagree with Eryximachus, Socrates, for he gives us a static picture of society which I cannot accept. He may be right at the moment about the average man, but what education has the poor fellow had, and how long has he had it? We have hardly scratched the surface of education yet. What we have is elementary and empirical, and even our best will in future be regarded as unscientific and primitive. We have no conception at present of the development of the human mind which may become possible when we have a universal education based on a truly scientific psychology, which is only just coming into sight. It is quite unjustifiable to accept as permanent a stratification of society into the intelligent few and the average masses. And if education is primitive here, it has hardly begun for most of mankind. Human nature may seem stationary to Eryximachus: to me it has the static quality of a space-rocket during the count-down before it is launched.

DELPHICUS: I think Theologus also is living in a static world, which is equally illusory. Two thousand years ago men's vision of time was very restricted. History, such as it was, described changes, but they were changes without direction; and science, such as it was, knew no better. So it was natural that man should be seen as an individual, entering time at his birth and leaving it at his death, a solitary pilgrim progressing to an eternity of bliss or torture, according to his behaviour on the road. This was to see life under the aspect of one eternity, but science today shows us another, and one, surely, equally noble. For hundreds of millions of years life has been developing on the earth, from relatively simple forms to its supreme achievement in man. And in man we find not only its most complex manifestation, the human brain, but also a new stage of evolution. Mind has discovered a way of surviving the body. Cultures are stable systems of ideas which outlast generations of the individuals on whom they impose their forms. Cultures and ideas themselves evolve and compete for survival. In the past, cultures have evolved unconsciously and without relation to the facts of science: now for the first time man is in a position to control the course of his own evolution in the light of his knowledge of life and the mind. And this knowledge is increasing with an accelerating acceleration.

ERYXIMACHUS: All the same, I am not so far impressed with psychology as a science, nor convinced that the mind can ever be made the subject of scientific knowledge.

ANALYTICUS: Perhaps Eryximachus is unfamiliar with the progress which is already being made towards a scientific psychology. I would agree that some current psychological ideas are still crude, but so were the ideas of the early chemists. But psychologists are now making measurable observations on emotions as well as on perceptions and ideas. They are studying mind in insects and birds, and the lower mammals and the higher apes, as well as in man. They are observing how its development influences its maturity, and they are learning that man's mind, however much more complex it may be, is not different in kind from the minds of animals. Extrapolating, our scientific knowledge of human nature may in time be as far ahead of present psychology as modern atomic physics is in advance of the ideas of the early chemists. Eryximachus is a rash man to say that human nature is unlikely to be changed, for we shall certainly learn how to change it scientifically.

ERYXIMACHUS: If Analyticus is right, I hope I don't live to see it. Are we to look forward to a day when all infants are conditioned from birth to become workers in a human beehive? And who are the psychologists, or any other scientists, to decide what is good for mankind, or indeed what is good in itself? Where do they get their values from?

ANALYTICUS: Eryximachus has uttered three misconceptions in as many sentences. He has again made that illogical distinction between society and the individual. Psychologists do not impose their methods upon education. They only discover the facts, and it is for society to make what use of them it thinks fit. Then, why should more knowledge of the mind lead to a State like a beehive, where mind exists at a very low and instinctive level? Exactly the opposite is true. The more men's minds are developed, the richer their experience

becomes, and the greater the freedom they will demand. And as for values . . .

SOCRATES (*who had been sitting for a long time with his eyes closed*): Where do you get your values from, Eryximachus?

ERYXIMACHUS: Let Theologus answer for me, Socrates, for it was from him that I learned them.

SOCRATES: Well, Theologus, explain to us why we should regard one action as better than another,

THEOLOGUS: Not by its consequences, Socrates, for we should then have to explain why one consequence was better than another, and we should only have postponed the answer to our question. I do not myself believe that this visible world contains the source of our values, but that they issue from a divine ordinance which alone can establish what is right and what is wrong.

SOCRATES: And can you prove the existence of the divine source of values?

THEOLOGUS: No, for though such a belief is consistent with reason, it cannot be attained by reason alone, but only by an act of faith.

APOLLODORUS: I do not think, Socrates, that there is any need to postulate a divine source of right and wrong, for I believe that reason is the highest value, and that if men will only be reasonable they will not fail to understand that good is better than evil.

SOCRATES: But if reason is a value, Apollodorus, it can hardly be used to justify values. What evidence have you that the world is reasonable, or that what has always happened in the past will happen again tomorrow? Is not belief in reason itself an act of faith? Come, Delphicus, give us your views as a scientist about the origin of values.

DELPHICUS: Evolution, Socrates, has produced all the values we know, and our highest values would not have survived, if they had not promoted the development of the evolutionary process. Values are inherent in life, and develop and become enriched as evolution progresses.

THEOLOGUS: I do not see how survival can explain values, Socrates. All living types have survived, so survival by itself cannot be a reason for believing some to exhibit higher values than others. Cultures, Delphicus tells us, compete with one another, but victory for a culture may depend on power, which is unrelated to the highest values, and may even lead to their destruction. There must be some standard of values other than mere fitness to survive.

DELPHICUS: Even if there is, that does not mean that it is imposed on us from without. From the unconscious the evolutionary process has produced consciousness, from blindness vision, from automatism reason, from impulse values and a sense of purpose. These are realities, however, you explain them. I am content to say that it has created in me a sense of values, and enabled me to understand in some measure how the good may be increased.

SOCRATES: It would seem, then, that we are all committed to an act of faith, and that reason itself rests upon something beyond reason. May there not be one light, whether we seek it above Nature or in the evolutionary process, and whether we find it outside ourselves or within?

Medicine and the Law

Diabetic Driver Penalised

A DIABETIC driver found in insulin coma at the wheel of his car was fined £20 and ordered to pay £19 19*s.* 8*d.* costs at Jarrow on Dec. 15.[1] He was charged with being under the influence of a drug to such an extent as to be incapable of having proper control of the car. The chairman of the magistrates said: "We are not happy about it at all, but we have had to find you guilty. . . . We considered disqualifying you from driving."

1. *Birmingham Post*, Dec. 16, 1959.

In England Now

A Running Commentary by Peripatetic Correspondents

WHILE sipping a quiet gin-and-procaine at the local Derby and Joan Club we read with concern of the testing of a new hypnotic methylorthotolylquinazalone by giving it to Siamese fighting fish. That such behaviour is hardly of "the-straight bat-on-the-field-and-off" standard expected of our professions is an opinion shared by the manager of a Siamese fighting fish, Harmonious Dawn Breeze (nom de guerre, the Cambodian Killer), whose training-camp we recently visited at the gas works end of the aquarium (where the bubbles come in through that little pipe). Trained to the last scale, said the manager, his boy, who throws the wickedest bunch of fives in the fight game, had been clouting his sparring-partners all round the tank, and on form should have won by the short route, stopping his opponent inside three rounds.

The Killer himself had been supremely confident, intending to take the fight to the challenger, Phlegmatic Phred, immediately the latter entered his territorial waters. "It's a roight to de body, see, den a left to de gills and I brings over me tail, BAM!" The Killer's self-assurance had seemed justified as Phred's record was such that he thought the first three English numerals were "Nine, ten, OUT!"

But come fight night, when it was all Lombard Street to a Siamese custard-apple that Phlegmatic Phred would be sunk without trace, the Killer was found lolling about on his water-weed, heavy-lidded and languidly trickling streams of bubbles through his gills, like something dreamed up by the late Aubrey Beardsley. His manager, a keen external student of the T.V. School of Medicine, diagnosed the syndrome immediately as methylorthotolylquinazalone poisoning, probably administered in ants' eggs. Pausing only to telephone his bookie, the Press, and the fight-promoter, he arranged for the Killer's emergency admission to Ward 10 of the Oxbridge Hospital.

So there we have it—tragedy, instead of one more stride along the road to the World Title. Any further hanky-panky with these schedule-4 preparations and Yul Brynner will be recalling the Siamese ambassador, questions will be asked in U.N.O., and someone will be in trouble for prescribing methylorthotolylquinazalone for use in his aquarium.

* * *

"I'M WALKING BACKWARDS FOR CHRISTMAS"

Notice on Christmas Collections from our laundry:

Monday will be Saturday, 19th December, 1959.
Tuesday will be Monday, 21st December, 1959.
Wednesday will be Tuesday, 22nd December, 1959.
Thursday will be Wednesday, 23rd December, 1959.
Friday will be Thursday, 24th December, 1959.
Week following Christmas will be normal days.

* * *

"You will always meet someone you know in Princes Street." On my return to Edinburgh, after 20 years' practising in darkest Africa, I set out one morning to put this saying to the test.

Strange enough, I hadn't gone far before I met Willie Jack, the chemist from my old home town. We were having a cosy chat when who should pass among the crowd but Bill Lees. I had known Bill abroad, and together we once did a fore-quarter amputation in Zomba. Hastily, I broke off my conversation with the chemist, cut my way through the crowd, and greeted Bill loudly and heartily. But he did not respond; in fact it wasn't Bill Lees at all, but someone very like him. I felt a bit of an ass. Later in the day, as I motored through another part of the city, near the King's Theatre, I saw Bill Lees. Yes, it was him this time. I would know his gait anywhere, so we could crow about that forequarter after all. I parked the car and sprinted after him. He was walking with both his hands behind him with his hat firmly clasped in them. As he turned into a side street, I neatly pinched the hat from him. He turned round, obviously startled, but not so startled as I was—because it was the same man I had accosted in Princes

reet! "Who are you?" he shouted, "and what do you nt?" I tried to explain—but I doubt if he believed me. Next time I meet Bill Lees I'll wait until he greets me.

* * *

The Letters to the Editor about the antigenic properties of as prompt me to report some observations of my own on this oblem. To me the status of ideas as true antigens seems estionable.

It is well known that ideas can never cause auto-immune sponses: no case has ever been reported of the anaphylactoid sponse of a host to his own ideas, though it is probable that a portion of endogenous ideas is slowly destroyed by processes convenient oblivion. On the other hand, responses of varying verity may be produced by the introduction of ideas to fferent recipients. Passive transfer of responses has often en observed, particularly from violent responders.

Though it is difficult to obtain adequate statistical evidence, is probably uncommon for idea-introduction (I.I.) to elicit y response at all, though this may be in part due to resistance duced by the poorly understood process of medical education. evere responses to I.I. are manifested by correspondence, th private and public, though the latter indicates the more ofound effect. There is some evidence that the nature of the action is largely determined by the structure of the idea elf; this, though it need not necessarily be correct, must ossess a minimum level of plausibility. Below this level, all tempts at I.I. meet with rejection, and at very low levels jection may be accompanied by ridicule.

It seems possible that the responses to I.I. may be idiocratic rather than immune, because violent responses can e obtained from recipients who have not previously been posed to the idea in question. But the possibility cannot be cluded that such recipients may themselves have elaborated e same ideas previously, so that antigenicity cannot be ruled ut. Much work remains to be done, and it is to be hoped that ppropriate cross-immunity and antibody-labelling studies ill improve our understanding of this relatively unexplored eld.

* * *

The West African candidate was faultlessly dressed, fluent, nd well-mannered. He responded to our routine questions ith deceptive ease and I was not surprised at his smooth andling of the unanswerable chestnut "Why do you want to ecome a doctor?" "It is, sir, my father's dearest wish."

But some chairmen are never content and ours probed a ttle further. "Well, sir, he feels I could be an enormous elp to him over the things he is not at present allowed to do n his practice. You know, injections, anæsthetics, dangerous rugs, and things like that." "What does your father do then?" "He's a witch doctor, sir."

* * *

The chipmunk, unfortunately, is not the only disappearing nimal in the States. I have just returned from a visit to Michigan, the Wolverine State. When the last wild wolverine was free in Michigan we were all in short trousers. The American) Robin, the State bird, is falling foul of "fallout" quite as dangerous as ^{90}Sr. Chemicals of the D.D.T. type prayed into nearly every tree in the area to protect against Dutch-elm disease fall with the leaves to form a lethal carpet n the ground (why don't they plant maples?). Earthworms at the leaves and when the red-red Robin comes bob-bobbobbing along the early bird gets the poison worm. Soon the nly Robins will be on Christmas cards.

* * *

We're poor little docs. who've lost our way,
Baa! Baa! Baa!
We're little black sheep who've gone astray,
Baa—aa—aa!
All of us, specialist or G.P.,
Damned from here to Eternity
('Cause our phones were tapped by the G.M.C.)—
Baa! Yah! Bah!

Letters to the Editor

LEAF PROTEIN AS HUMAN FOOD

SIR,—The brief résumé that Dr. Williams gives (Dec. 12) of the methods used in Africa to preserve and serve leafy vegetables is most welcome. I had three reasons for not referring in my article of Nov. 28 to the importance of increasing the use of unprocessed leaves: this had already been an important theme in two earlier publications [1 2]; I did not wish to complicate my article by raising two issues in it; the extent to which leaves, as they are collected, can be used as a protein source is limited. The last reason is the most important.

Bernard Shaw remarked somewhere that the vegetarian diet filled one with wind and selfrighteousness. I do not wholly agree with him on the second point, but there is substance in the first because of the large amount of fibre in all but the youngest leaves. Seeds and tubers have not only the merit that they can be stored but also that they contain so little fibre that they can be eaten in bulk when properly cooked. Immature flowers (cauliflower and broccoli) are likewise largely digestible, but a sharp limit is set to the amount of even the most carefully selected leaf that it is advisable to eat. In most parts of the world this limit is seldom reached. Much would therefore be gained if the value of leafy vegetables were more widely recognised, not only as a source of vitamins and minerals but as a source of protein.

I am in complete agreement with nearly all that Dr. Williams said in her letter, in an earlier article [3] on Self-help in Nutrition, and in conversation about the need for more nutritional education. My only cavils are that we still need research if enough vegetables are to be produced to meet the demand we hope to excite, and that it is unlikely that leafy vegetables will supply more than one-twentieth of the protein needed. In West Africa the local leafy plants are at present despised by Europeans and sophisticated Africans. European vegetables do not grow satisfactorily; these people therefore rely on imported vegetables from the deep-freezer and then complain about the high cost of living. It is inconceivable that plant-breeders could not, with a few years' research, produce suitable varieties of our vegetables and improved varieties of, for example, the indigenous amaranths.

One phrase in my article seems to have been unclear. I said that some chlorophyll escaped destruction if more than 20 g. of leaf protein was eaten in a day. It is probable that Dr. Williams is right and that the ability to destroy chlorophyll could be increased with habituation to a diet containing large amounts of it. But, as I pointed out, it does not matter whether it is destroyed or not. Furthermore, few would wish to eat more than 20 g. of leaf protein every day. That is about a third of the daily requirement and it would be an adequate supplement to a diet that contained enough of one of the cereal seeds to satisfy calorie demands. It is only on a diet in which the main energy needs are met by fat or cassava tubers that a greater level of protein supplementation would be needed if the diet were otherwise adequate. It seems possible therefore that Dr. Williams thought I meant 20 g. of leaf and not 20 g. of protein.

For reasons that have never been clear to me, some

1. *Proc. Nutr. Soc.* 1956, **15**, 154.
2. *Mem. Manchester Lit. Phil. Soc.* 1959, **101**, 96.
3. *Lancet*, 1954, i, 323.

people tend to consider propositions in antithesis, as if it were not possible to resolve a difficulty in several different parallel ways. Sometimes this approach is sound: because one cannot be in two places at once, one must be either here or there. But why adopt this approach, as Mr. Allen (Dec. 12) does, when conditions throughout the world are very varied and more than half its inhabitants need more food. Wherever water hyacinth is being fed to pigs there is no immediate need to do anything except say "Splendid!"; but many photographs have appeared recently showing square miles of water hyacinth in the Sudan and, as I pointed out, much money is being spent on attempts to kill it. I have nothing but admiration for those who are promoting pig-farming, but I still think it is prudent to examine the other possible solutions to the problem. Similarly with the other examples Mr. Allen gives. I readily believe that some sugar-cane tops are fed to cattle in Mauritius and elsewhere, but the published statistics do not suggest that most of them are used in this way. Nor is it likely that there are enough objects waiting to be wrapped up to consume all the banana leaves in countries where bananas are an important crop. I should, however, add that these three species of leaf are not available here so we do not know whether their protein would be readily extracted or not. My plea was for some research on the subject and not for the immediate establishment of factories.

Rothamsted Experimental Station, Harpenden, Herts. N. W. PIRIE.

DENTISTS AND ANCILLARIES

SIR,—I expected the British Dental Association to issue a *dementi* to your annotation of Dec. 5.

It is exactly your attitude to my profession that is one of the causes of our lack of recruits. You say that dentistry is restricted: so are other specialties. You say that it is without glamour: so I imagine is proctology. And you say that it is unadventurous: I disagree.

I find, in selecting the best treatment for a tooth, for a dentition, and for a patient, that my experience and wits are well exercised and that I lead a full and satisfactory professional life. To this you may well give the answer given to the trout fisherman—"off to pit his wits against the trout"—"Fifty-fifty I presume?" But I also get from my job profound æsthetic satisfaction—a dental emotion you ignore.

Then the phrases you use about the training of dental ancillaries are quite tendentious. The word "straightforward" has too many overtones for you to use it about work on live dental tissue. And you must well know that what you call strict personal supervision will be no closer than that of the dental student in the conservation-room. I have taught both students and hygienists and I know that the words personal and strict are here misleading: there is not to be one instructor per ancillary.

An examiner once said of a candidate that he had done more damage to a tooth in five minutes than caries could have done in five years. This particular candidate was a fifth-year student working on an adult, not an ancillary working on a child, the pulps of whose teeth are very near the surface.

It would surely be more honest to admit that the training of dental ancillaries is a political expedient and not to gloze the pill with verbal sugar.

London, S.W.20. AUSTIN WAKEFORD.

HOMOSEXUALITY AND THE LAW

SIR,—I am more than a little disturbed by the tone of the article on homosexuality in your issue of Dec. 12, and of your leading article. Surely the more important aspect of the question, and one which is given little or no emphasis, is that homosexual behaviour is morally wrong. It follows that acceptance of such a mode of life carries with it inevitable consequences not only for the individual but for the family, for the community, and for the nation.

To say that there is no answer to the problem other than to accept it is to advocate a policy of "coexistence with evil" which is indeed defeatist. It denies the evidence of the New Testament and of Christian witness down the centuries, that there is an answer to this as to other moral problems. We have innumerable examples of the truth that human nature can be changed. The remedy is to our hand if we will apply it. If we do not, then the consequences are upon our own heads.

Royal Infirmary, Perth. W. M. WILSON.

SIR,—I read with interest the recent correspondence in *The Lancet* on this subject and was particularly impressed by the leading article and special article in your issue of Dec. 12.

The Homosexual Law Reform Society, which is well sponsored by leading doctors, lawyers, and clergy, is working for the implementation of the Wolfenden proposals. To that end we are trying to promote a wider and more rational understanding of the problem. The Society represents varying points of view on the medical moral issues involved; but its members are all agreed that the present law is unjust, that it cannot be fairly applied, and that it does not provide an adequate solution to the social problem of homosexuality.

If we can give any help to members of the medical profession who may wish to urge that this legal reform should be implemented, we shall be very pleased to do so.

A. HALLIDIE SMITH
Rooms 27/29, 32, Shaftesbury Avenue, London, W.1. Secretary, The Homosexual Law Reform Society.

ORTHO-CRESYL PHOSPHATE POISONING

SIR,—Although I have not been directly connected with this problem for several years, I feel that the letter of Dr. Susser and Dr. Stein (Dec. 12) cannot be allowed to pass without comment. They put forward a hypothesis for the mechanism of action of tri-ortho-cresyl-phosphate intoxication that perpetuates an error in premise that has led others astray in earlier years, despite the efforts of myself and others [1 2] to rectify matters. Thus, there is no satisfactory evidence for believing that the neurological lesion in this intoxication is a primary demyelination, in the sense that the myelin sheath is the initial seat of damage and that the axons are spared. Indeed, all the indications, both from human material and from work with the chicken, which suffers an essentially similar train of disturbances, are that this is a systematised neuronal degeneration, and that myelin breakdown is secondary to axon destruction. When one finds lesions at the distal ends of selected long tracts in the spinal cord, affecting axons as well as myelin sheaths, and leaving the peri-karya intact until a late stage of the process, one cannot explain this on the basis of a primary demyelination, unless entirely new concepts of this latter process be introduced. Such systematised lesions are, however, analogous to those met with in amyotrophic lateral

1. Cavanagh, J. B. *J. Neurol. Neurosurg.* 1954, **17**, 163,
2. Fenton, J. C. B. *J. Path. Bact.* 1955, **69**, 163.

crosis, Friedreich's ataxia, and beriberi, to name only better known conditions, and none of these have ever far as I am aware been ascribed to a primary demyelina-n. T.O.C.P. intoxication is of considerable theoretical portance, and if there is any clear thinking to be done out its mechanisms the significance of the morphological ttern of the lesions must be firmly grasped.

The second point I wish to make is that the ætiological dition of pseudocholinesterase in this condition is even aker than your correspondents imply. The enzyme is ind predominantly in neuroglial cells and in Schwann lls, not in axons. There is no indication as to whether plays any significant role in myelin formation, and indeed icks during myelin formation are insensitive to the urotoxic effects of T.O.C.P. [3] The natural substrate(s) the enzyme(s) is unknown, and after T.O.C.P. poisoning e enzyme levels are returning to normal when the ralysis begins. Because there is depression of this zyme in serum and nervous tissue during the days fore the onset of paralysis, it does not of necessity ean that there is any causal relation between these two served phenomena.

I sincerely trust that the unsatisfactory state of our owledge of biochemical changes in this neurological toxication will be borne in mind by investigators of this cent and any subsequent outbreaks of poisoning by ese compounds.

Department of Pathology,
Guy's Hospital Medical School,
London, S.E.1. J. B. CAVANAGH.

THE NATURE OF ESSENTIAL HYPERTENSION

SIR,—The main evidence for a dominant gene as a se of hypertension appears to rest on bimodal dis-ibutions of arterial pressure. Here is some further formation taken from personal records of student health aminations which is of interest in this connection. rom 500 records of men I have culled 114 with a family istory of heart-attack, high blood-pressure, or a stroke. he blood-pressure readings of students with a positive mily history have been distributed and compared with ntrols with neighbouring serial numbers, matched r age but without this particular family history. Taken parately, maternal and grandparental influence on son's lood-pressure appeared to be negligible. But the figures r 49 fathers were as shown in table I.

TABLE I—SONS' BLOOD-PRESSURES

—	Sons' blood-pressure (mm. Hg)			
	Systolic		Diastolic	
	<130	130+	<80	80+
Fathers dead	15	8	14	9
Fathers alive	12	14	12	14
	$\chi^2_1 = 1{\cdot}82$ (not sig.)		$\chi^2_1 = 1{\cdot}05$ (not sig.)	
Fathers heart-attack ..	21	9	16	14
Fathers raised blood-pressure or stroke	6	13	10	9
	$\chi^2_1 = 7{\cdot}01$ (sig.)		$\chi^2_1 = 0{\cdot}03$ (not sig.)	
All affected fathers: n = 49	27	22	26	23
Controls: n = 114 ..	65	49	62	52
	$\chi^2_1 = 0{\cdot}04$ (not sig.)		$\chi^2_1 = 0{\cdot}02$ (not sig.)	

Higher pressures were found more often among students hose fathers were alive than among those whose fathers had ied, but the difference is not significant. A more striking fference, significant this time at the 1% level, was found for stolic pressure when sons of fathers with heart-attacks were mpared with sons whose fathers were known to suffer from raised blood-pressure. Thus far the findings suggest a somewhat comparable situation among students to that reported by Dr. Morrison and Professor Morris (Nov. 21) among busmen and their parents. The blood-pressure distribution for all sons with a positive family history differs only slightly from controls, but that for fathers may be subdivided into two curves with separate modes according to whether father is alive or dead, and the results go further in suggesting that the students whose fathers have had coronary disease have the lower blood-pressure peak, the students with hypertensive fathers the higher peak. Thus it appears that there may be other qualitative causes of a bifid or bimodal distribution than segregation of characteristics where a dominant gene operates.

The second point I want to make is that significant variation may occur in the distribution of arterial pressures according to body build.

When the 104 extreme pyknic builds (peripheral phenotypes of dominance Fm and Mf, as defined in *Behaviour and Physique* [1]) are compared with the remainder of a series of 343 healthy students, the mean systolic pressure is 2·7 mm. higher in the "pyknics"—that is, in the direction expected—and the value for t is 1·93, which, on a one-tailed test, is significant at the 5% level. Though essentially unimodal in each case, the smoothed curves, with averaged adjacent readings at each 5 mg., have separate modes 10 mm. apart at 122 and 132 mm. of mercury. For diastolic pressures t reached the significant value of 2·42, although the modes were less far apart.

Supposing then that bus drivers have, as a group, a much higher proportion of pyknic physiques, and fewer linear builds than bus conductors, one might expect drivers to show more marked bimodality in their arterial pressure distribution. There is evidence from Morris et al.[2] that drivers measure more round the chest and round the waist than conductors. There is evidence, too, that coronary disease occurs more often in types Fm and Mf.[3] Lastly, one would further expect older busmen to have an increasing proportion of relatives suffering and dying from cerebral complications of hypertension rather than coronary disease, which in men makes its impact earlier.

Bodily habitus then is a factor to reckon with—indeed the phrase "habitus apoplecticus" comes of ancient lineage. Although it will not be found in the index of the last edition of *Price's Textbook of Medicine*, it is here of great relevance and interest because evidence is steadily accumulating of measured likeness in the body shape of parents and children. And, as in the case of height, weight, and intelligence, it seems reasonably certain that the inheritance of body shape is determined polygenically.[3 4] Evidence of bimodal distributions in certain occupations and first-degree relatives is surely determined, at least in part, by the effect of physique in modifying the expression of whatever genetic basis there is to hypertension. In short, much, though perhaps not all, of the available evidence of inheritance in hypertension may be explicable on this hypothesis.

To test this notion further, it may be argued that if "habitus apoplecticus" is a reality, then the sons of parents with "apoplexy" should be of "habitus apoplecticus" more often than other young men. I have therefore analysed the body build of those sons who had been phenotyped—unfortunately not all. The results appear in table II. Taking types Fm and Mf for convenience to define "habitus apoplecticus", the evidence favours the hypothesis, for significantly more sons of affected parents have this particular build.

In conclusion, then, it seems that the evidence so far advanced for a dominant gene being a cause of hypertension is not conclusive. Bimodal distributions may be

1. Parnell, R. W. Behaviour and Physique. London, 1958.
2. Morris, J. N., Heady, J. A., Raffle, P. A. B. *Lancet*, 1956, ii, 569.
3. Parnell, R. W. *Eugen. Rev.* 1959, **51**, 75.
4. Parnell, R. W. *Brit. med. J.* 1959, i, 232.

3. Cavanagh, J. B. Unpublished observations.

TABLE II—BODY BUILD OF SONS PHENOTYPED

—	Phenotypes Mf, Fm	Other physiques
Heart attack in		
Father	14	8
Mother	3	0
Raised blood-pressure or stroke		
Father	6	4
Mother	7	4
Men students with affected parents	30	16
Controls	36	44

$\chi^2_1 = 4{\cdot}56$ (sig.)

due to other causes, and among these physical habitus deserves to be considered because of the modifying influence it exercises on the expression of hypertension—an influence which is presumed to be polygenetic. However, caution is needed because the early data presented here are limited to little more than a pilot group, and essential hypertension is well known to occur in people of linear build too, though probably rather later in life. Should a large prospective survey of families be organised, I hope it will be possible to include an assessment of physique: suitable somatometric methods are now available which do not necessarily require photography.

The Warneford Hospital, Oxford. R. W. PARNELL.

"TELEPHONE TAPPING"

SIR,—So the disciplinary committee of the General Medical Council has resorted to the keyhole. I had hoped that one of authority rather than my own pen would have been taken up in protest against the squalid expedient used in a recent case before the committee. As guardian of our moral code, justifiably rigid, and in its function of representing our group super-ego, has it not slipped at least in this instance! How in the name of decency and example, could the Council resort to evidence obtained from phone-tapping! Against the police and public authority the outcry has been great; how much more so is the G.M.C. to be condemned for its participation in this eavesdropping method of obtaining evidence.

"Whatsoever house I enter, there will I go for the benefit of the sick, refraining from all wrong doings or corruption, and especially from any act of seduction of male or female, of bond or free. Whatsoever things I see or hear concerning the life of men, in my attendances on the sick or even apart therefrom, which ought not to be noised abroad, I will keep silence thereon, counting such things to be as sacred secrets." Is this oath taken up by each of us separately meant to be an individual precept only, or, for the Establishment, is any means to an end justifiable? I wonder what Hippocrates would have said.

London, W.1. S. CHARLES LEWSEN.

SERUM-BILE-ACID LEVELS IN LIVER DISEASE

SIR,—With reference to the article by Professor Sherlock and her colleagues (Dec. 12), the intolerable pruritus experienced by some patients with jaundice due to retention of bile-salts in the blood is relieved in a matter of minutes under wet heat.[1] This relief becomes permanent after a few days' treatment under sweating in wet heat, while the serum levels of bilirubin are also lowered to normal over a period of time.

Tunbridge Wells. E. F. ST J. LYBURN.

1. Lyburn, E. F. St J. *J. Physiol.* 1956, **134**, 207.

EMERGENCY RESUSCITATION IN RUPTURED ECTOPIC GESTATION

SIR,—I was interested to read Mr. Azie's letter. The method has been common practice in Jamaica for several years, and the advantages described by Mr. Azie have been proved time and again.

On one occasion, however, it did raise an interesting medico-religious problem because the patient was a Jehovah Witness. As she was being wheeled along the corridor to the ward, her husband attempted to withdraw the transfusion needle because he said it was against the Jehovah's Commandments to give blood. While I had no desire to compel this unconscious woman to do that which she considered sinful, I was anxious that the patient should not lose her life through what appeared to me to be a misapplication of a scriptural principle. I explained to the husband that the woman was receiving her own blood, which rather surprised him, and he told me that he would have to go and ask the minister's opinion on the matter. In the meantime we could allow the transfusion to continue. By the time he returned she had received about a pint of blood and her condition had improved considerably.

Shipley, Yorkshire. H. P. BURROWES.

TREATMENT OF BLEEDING PEPTIC ULCER

SIR,—We are obliged to Dr. Avery Jones and Mr. Downie (Dec. 12) for their comments on our recent communication on blind gastrectomy.

We are naturally in agreement with Dr. Avery Jones about the need for a combined medical and surgical approach in the management of serious bleeding from the alimentary tract. This, of course, is a simple matter in the gastrointestinal unit at the Western General Hospital where a considerable proportion of the patients referred to in the paper were treated, and where complete medical and surgical cooperation is the invariable practice. The senior author is a member of that unit, and we are both grateful to the other members of the unit for access to some of the relevant details of patients under their particular care, though the conclusions drawn are those of the authors of the paper only.

We could perhaps have made it clearer that we were not on this occasion concerned with the problem of bleeding peptic ulcer in general. We have no doubt that, as Dr. Avery Jones says, the overall mortality from this should be within the range of 4% to 7%; but our immediate concern was with the specific question of the justification or otherwise of gastric resection in the absence of an obvious lesion. We were convinced that it was justifiable and such evidence as was collected for the paper seemed to us to support this view. It certainly seems preferable to "wide gastro-duodenotomy", at best a disagreeable and clumsy exploration, which when positive in three cases out of four must be followed by gastrectomy, and when negative in the fourth case, must be followed by gastric resection, on the assumption that the bleeding is caused by gastritis!

We have no experience of the use of 'Stypven' either in the treatment or in the selection for operation of patients with massive gastric hæmorrhage, and we are grateful to Mr. Downie for recalling it. His observations are most pertinent, and we will look forward to a detailed record of his actual experiences.

Finally, Sir, the omission of "in" before Western General Hospital in the last sentence of the first paragraph of our paper, might give the impression that there

was a professorial unit at the Western General Hospital. Such is not in fact the case, and the association of the senior author with the gastrointestinal unit is on a personal and not professorial basis.

Department of Clinical Surgery,
University of Edinburgh. JOHN BRUCE.

SIR,—In their survey of 1433 patients with severely bleeding gastric or duodenal ulcers Dr. Römcke and his colleagues (Dec. 5) state that in 1951–57 578 patients were admitted—and 23 died. In the group of 419 patients who did not bleed after admission, 12 patients died. We may assume that in no case was death due to exsanguination. 159 patients had continued bleeding, and 88 had an operation. It is not expressly stated by the authors, but we may take it that the 88 patients fulfilled their criteria for operation: 45 years of age and continued bleeding after admission to hospital. Only 5 patients died following operation.

71 patients with continued bleeding were treated conservatively. We may assume that they were either below 45 years, that the continued bleeding was slight, or that they had certain complications—or refused operation. 6 patients with continued bleeding, who did not have an operation, died.

Provided these assumptions are correct, some major points need clarification. How much " continued bleeding " is required to precipitate the indication for operation? What was the cause of death in the 6 patients with continued bleeding who died unoperated? Did any one die from exsanguination, and were there any deaths in the age-group below 45?

Surgical Department A,
Bispebjerg Hospital,
Copenhagen. K. H. KØSTER.

SIR,—I was most interested in the article by Professor Bruce and Mr. Dudley. I see that of their 31 cases no less than 30 presented with hæmatemesis. This is a selected series where the source of the bleeding is practically bound to be from above the level of the duodenum. Blind gastrectomy in such a series would tend to have favourable results. I feel that the problem is more difficult in patients with severe melæna without hæmatemesis, in whom no diagnosis is made.

A patient was recently treated unsuccessfully in this hospital by blind gastrectomy for severe melæna. He subsequently had a further operation during a phase of active bleeding when the source of the hæmorrhage was discovered. He was a 56-year-old man with no previous history of indigestion, who was admitted during his third attack of severe melæna. He was transfused with 8 pints of blood, and subsequent investigations, which included barium meal, barium enema, and hæmatological tests for deficiencies in the clotting mechanism, were all negative. At laparotomy no abnormality was discovered, apart from a small congenital duodenal diverticulum with intact mucosa. A blind partial gastrectomy was performed. He had a severe melæna immediately postoperatively requiring a large transfusion. He was finally discharged home and advised to come back immediately should he have any further melæna. Six weeks later he was readmitted with a severe melæna, and a further laparotomy was carried out immediately. On this occasion a small nodule, 2 mm. in diameter, was felt in the mesenteric border of the upper jejunum, about 2 ft. from the ileocæcal valve, the blood having been detected in the jejunum about 2 ft. below this lesion. The nodule proved to be a small necrotic hæmangioma with a small central artery supplying it, which contained a plug of clot. The patient has been perfectly well since.

This patient lost his stomach needlessly. I feel this case illustrates how small the lesion may be, and how important it is to make a careful search of the gastrointestinal tract during a phase of bleeding when presumably the lesion is somewhat congested and enlarged. The level of blood in the intestine may give some guide to the site of the lesion.

The London Hospital,
London, E.1. B. LYTTON.

NATURAL HISTORY OF CAVERNOUS HÆMANGIOMATA

SIR,—I should like to congratulate Dr. Simpson (Dec. 12) on adding, through his careful follow-up, to the knowledge of the natural history of cavernous hæmangiomata.

Bowers [1] also recently reported another careful investigation and it now seems quite clear that the lesions disappear spontaneously, and that the final appearance cannot be improved upon by any form of treatment. I would agree with Dr. Simpson that the ulceration which sometimes develops, particularly in the larger lesions or in sites where chaffing and trauma occur, is rarely a serious complication. However, in my experience these ulcers are unexpectedly painful, and slight pressure or removal of the dressing will usually cause obvious severe pain. Dr. Simpson in giving details of two infants with ulceration describes them as being miserable, and I am not at all surprised at this. I would also agree with him that hæmorrhage from ulcerated cavernous hæmangiomata rarely gives rise to anxiety although I have seen two cases with protracted extensive ulceration who have gradually developed iron-deficiency anæmia with hæmoglobin estimations below 60%.

United Bristol Hospitals,
Bristol. ROBERT P. WARIN.

Parliament

Telephone Tappings

ON Dec. 16 in the House of Commons Mr. GORDON WALKER raised the question of the telephone conversation intercepted by the police without a warrant which was later admitted as evidence before the Disciplinary Committee of the General Medical Council.[2] He deplored the interception of the conversation because he believed that every citizen who used any means of communication provided by the State should have an absolute assurance that his communications, his talks, or his letters, should not be deliberately intercepted by an agent of the State without a warrant. The subsequent disclosure seemed to him to make the original interception even worse. It meant that the words of a man were secretly taken down by the police, without his being warned and without his knowledge, and used in evidence where he was in jeopardy. Why had the material not been destroyed when it was decided not to institute criminal proceedings? The Home Secretary had said that he could have stopped its disclosure only by invoking Crown privilege. This was true only on the assumption that the material was not destroyed. No-one wanted an unnecessary extension of Crown privilege, but in this instance Mr. Walker thought that it would have been the lesser evil.

Mr. R. A. BUTLER, the Home Secretary, recalled the circumstances of the case which had given rise to the debate.

The police had concluded that there were no grounds for instituting criminal proceedings, but after the inquest the deputy coroner thought it right to bring the case to the attention of the General Medical Council. A solicitor acting on behalf of the Council subsequently interviewed the subscriber. She disclosed that the telephone conversation had taken place and had been overheard by the police. A subpœna was then served on the shorthand-writer to give evidence at the hearing before the Disciplinary Committee and to produce the shorthand notes of the telephone conversation. The Chief Constable thereupon referred the matter to Mr. Butler on the question of

1. Bowers, R. E. Annual Oration of the Dowling Club, 1959.
2. See *Lancet* Dec. 5, 1959, p. 1024.

whether Crown privilege should be claimed. After taking the advice of the Law Officers, he decided that it should not be claimed.

There was, Mr. Butler considered, the clearest possible distinction between listening to a single conversation with the agreement of one of the parties and the secret interception by the Post Office of all the telephone calls of a particular individual on the warrant of the Secretary of State. Members might nevertheless feel concerned that any material obtained by the police by listening-in to a telephone call, even with a subscriber's consent, should be passed on to an outside body.

In considering whether to claim Crown privilege Mr. Butler said a Minister must remember that executive interference with the processes of justice was inherently undesirable. When a court or tribunal had to try a case, it was obviously desirable that, as far as possible, all relevant evidence should be before it, otherwise one or other of the parties, and sometimes it was the defendant, might be prejudiced. Some kinds of evidence, however, must be excluded on the ground of the public interest, but when he was asked to consider this case the document did not seem to fall into a class in which privilege had been claimed in the past. The subscriber with whose agreement the record had been made had already informed the General Medical Council that a telephone conversation had taken place with the doctor concerned and that the police had listened in. Even if privilege had been claimed for the record, oral evidence of the conversation could have been—and in fact was—given by the subscriber. To have checked that would have been an inroad into the liberty of the subject.

Turning from the particular case to the general principle, Mr. Butler said that he recognised that there was uneasiness about the possibility that material obtained for a criminal investigation should later be used for a different purpose in disciplinary proceedings before a domestic tribunal or a professional body. Preliminary consultation with his Law Officers had suggested two possible approaches to this question.

First, was there a case for curtailing the powers of these professional disciplinary bodies? Preliminary views which he had received from the General Medical Council indicated that the powers of subpœna were vital to the thorough investigation of certain cases and might be vital for the person appearing before the tribunal. He had then wondered whether these powers, while not being withdrawn, might be subject to some control—for instance, power to obtain a subpœna only by leave of a judge or master of the High Court. The effect of this proposal would be that the Court—not the disciplinary body—would decide, if no claim of Crown privilege were made, whether the information should be disclosed.

Disciplinary tribunals had been charged by Parliament with the duty of preserving the good name and integrity of their professions. He did not think we should lightly interfere with bodies which had for many years performed with fairness and efficiency the duties entrusted to them. He thought that the House should have guidance before setting up bodies under the new Bill for the professions supplementary to medicine. The Government had therefore decided to set up a committee to examine this problem, with the following terms of reference:

To consider to what extent and subject to what conditions subpœnas (or in Scotland citations) should be issuable to secure the attendance of witnesses and the production of documents before disciplinary tribunals; and in particular to consider whether subpœnas should be issuable to secure the production before such tribunals of evidence obtained by police officers in the course of criminal investigation; and to make recommendations.

Lord Simonds had agreed to act as chairman of the committee.

Mr. PETER RAWLINSON pointed out that during the past sixty years the General Medical Council had only erased 290 names from the Medical Register. Since 1950 there had been only 3 appeals to the Judicial Committee and none had been successful. In the case from which this debate arose the Council received a letter from the deputy coroner, so that inquiries were made about the prescription given by the doctor to the deceased. Statements of the doctor to the police and letters which were left to the coroner were excluded from the consideration of the Committee as not being in accordance with the very strict rules of evidence. That was in favour of and to protect the practitioner.

Mr. W. F. DEEDES felt that evidence obtained by police for criminal proceedings ought not to be used for the judgment of morals and professional conduct outside the courts of justice. Not merely interception, but many other methods, had often to be employed within the law which were extremely powerful and extremely unpleasant.

Sir REGINALD MANNINGHAM-BULLER, the Attorney-General, emphasised that the Disciplinary Committee acted in the interests of the public. As recently as 1950 the House had decided to give it the right to subpœna a witness or document. He did not know whether the view of Parliament had changed today, but the question of the right to sue out subpœnas would fall for review by the committee under the chairmanship of Lord Simonds.

Mr. Walker's motion of censure was lost by 336 votes to 238.

Population (Statistics) Bill

In our report of this Bill (Nov. 28, p. 976) we stated incorrectly that the present practice in England is to give the duration of pregnancy on a stillbirth certificate. In fact this requirement will only be introduced by the Bill. We understand that the Registrar General has given an assurance that this information will only be made available for legal purposes except on a subpœna.

QUESTION TIME

Senior Registrars

Mr. L. A. PAVITT asked the Minister of Health how many time-expired senior registrars were at present employed in the National Health Service.—Mr. DEREK WALKER-SMITH replied: 119 at July 1, 1959. Mr. KENNETH ROBINSON: Can the Minister say how the figure of 119 compares with that of the previous twelve months; also, what effect the once-for-all arrangements has had on the limited number of permanent appointments.—Mr. WALKER-SMITH: In reply to the first part of that question, the number is 5 fewer than it was previously: in reply to the second part, we have had 23 proposals, of which 19 have been approved.

Medical Treatment in Military Hospitals

Mr. JOHN MCKAY asked the Minister if he would arrange that, for British people who get medical treatment in a British military hospital while on a temporary visit to Germany, in future no charge should be made to the individual, but that such treatment should be paid for by his Department.—Mr. WALKER-SMITH replied: I am afraid there are no funds at my disposal from which such expenses could be met. Mr. MCKAY: Is it not true that men are paying 1*s.* 10½*d.* a week or £5 a year for medical treatment under the National Health Service? Can the Minister say how much the National Health Service is saving by the policy which the Government are adopting in respect of people who go into military hospitals in Germany and elsewhere?—Mr. WALKER-SMITH: The National Health Service element in the National Insurance contribution is only a relatively small proportion of the finances of the National Health Service as a whole. What I have to do, and what I am permitted to do, under the National Health Service Act is to provide a health service in England and Wales. I fear that I have no power to pay for the cost of treatment obtained overseas. What we always seek to do is to make such reciprocal arrangements as we can with other countries, but there we are limited by the facilities that they have available.

Home Nursing Services in London

In reply to several questions Mr. WALKER-SMITH said that he had received from the London County Council proposals for altering, as from Sept. 1 next, the present arrangements for providing home nursing and, in certain areas, domiciliary midwifery services. These proposals required his approval before they could be brought into operation, and under the statutory procedure interested organisations had until Dec. 22 to make recommendations for their modification. He had already received a number of such recommendations.

Distinction Awards Committee

Mr. KENNETH ROBINSON asked the Minister if he would ensure that at least one psychiatrist served on the Moran

mmittee which decided merit awards.—Mr. WALKER-TH replied: Members of the Advisory Committee on tinction Awards are not appointed in any representative acity. One of them is in fact a psychiatrist.

Committee on Noise

The Minister of Health announced that the Government d decided to set up a committee to examine the nature, ses, and effects of the problem of noise and to advise what ther measures could be taken to mitigate it. The member-p would be announced later.

Expenditure on Mental-health Services

During 1958–59 about 11³/₄% of the total cost (about 71 million) of the National Health Service is identifiable as ving been spent on mental-health services. This includes ¼% by hospitals (about 19¹/₂% of their expenditure) and % by local health authorities (about 6¼% of their penditure).

Public Health

London in 1958

THE annual report [1] on London's health in 1958 by Dr. J. Scott, county medical officer of health, records a rising th-rate—16·8 per 1000 population, the highest since 1948 7·9). 9·9% of live births in 1958 were illegitimate. The tional percentage of illegitimate births has been steady over past decade, but the percentage for London has risen kingly during the past four years. The report says there is arly a greater risk of illegitimacy in London because of the ater proportion of potential mothers of whom proportion-ly fewer are married, "but this can hardly account for a e double that of England and Wales. There is no doubt at some part of the excess is due to the facilities London can er to an unmarried mother—ante-natal care, anonymity, d support from moral welfare organisations".

After heart-disease, cancer was once again the greatest cause of ath. During the past ten years deaths from cancer have increased about 14%. The increase has mainly been among men aged 45 d over. The greatest absolute increase for both sexes has been in ncer of the lung. Male death-rates from lung cancer (adjusted for e composition) were highest in the boroughs of Bethnal Green, insbury, Shoreditch, Islington, and St. Pancras in north London d Southwark and Bermondsey in south London.

The number of notifications of diphtheria was higher than in 1957 largely because of an outbreak in Finsbury, beginning in late ptember, which was fortunately almost entirely a bacteriological idemic. 2 deaths from diphtheria were registered during the year, e of a girl aged 9 and the other of a woman of 26.

A record number of emergency calls (an average of 272 a day) as received by the accident section of the London Ambulance rvice. As usual, Friday was the busiest day of the week, averaging out 300 calls, and December was the busiest month. The average me taken to reach the scene of street accidents, to which there were 5,690 calls, was six minutes. The 19,182 patients were admitted hospital within an average of 17·8 minutes from the time the first ll for assistance was received.

Appointments

OPE, D. H. P., M.B. Lond., F.F.A.R.C.S., D.A.: honorary anæsthetist, Hospital. of St. John and St. Elizabeth, London.

REENBERG, R. C., M.B. Lond., D.P.H.: senior M.O., mental health services, Middlesex.

ADLEY, M. W. M., M.D. Edin., M.R.C.P.E., D.M.R.D.: consultant radiologist, Royal Northern Infirmary and Raigmore Hospital, Inverness.

URRAY, B. T. A., M.B. Dubl., D.P.H., D.C.H.: assistant M.O.H. and assistant school M.O., Blackpool.

USGROVE, J. B. H., M.S. Lond.: honorary surgeon, E.N.T. department, Hospital of St. John and St. Elizabeth, London.

ERKINS, JOAN K., M.B. Cantab., F.F.A.R.C.S., D.A., D.OBST.: part-time consultant anæsthetist, Warrington group of hospitals and Winwick Hospital.

ERRELL, J. D., M.B. Glasg., D.P.H., D.C.H.: deputy M.O., Cumberland.

ALSH, G. P., M.B. N.U.I., D.P.M.: assistant psychiatrist, Rainhill Hospital.

[1] London County Council: Report of the County Medical Officer of Health and Principal School Medical Officer for the Year 1958. Obtainable from Information Bureau, County Hall, London, S.E.1. Pp. 184. 4s.

Notes and News

BRITISH ACADEMY OF FORENSIC SCIENCES

THIS Academy was formed earlier this year, and its objects are to encourage the study, improve the practice, and advance the knowledge of the forensic sciences, to hold meetings, to publish such material as is calculated to further the objects of the Academy, and to do all things that may widen, improve, and develop the education and knowledge of those engaged in the forensic sciences and of the public. A steering committee, under the chairmanship of Prof Leon Radzinowicz, drew up a constitution and policy. It has now disbanded and the Academy has become one of individual membership, "the qualifications for which shall be those who in the opinion of the Council of the Academy shall by reason of their professional standing or special knowledge and integrity have contributed or be likely to contribute to the advancement, application, and practice of the forensic sciences." "Membership will include those actively engaged in the various branches, those not actively engaged but who are experts in their specialist fields, and those who have to apply the results."

The Academy will have three main sections—law, medicine, and science, each with a separate committee. A research committee has been formed, with Prof. F. L. Warren as chairman. The secretary of the council is Dr. F. E. Camps, 37, Welbeck Street, London, W.1.

THE KING'S FUND

> "The Prince of Wales has particularly requested me to attend a meeting at Marlborough House on Thursday to consider a project he has for raising enough in this Diamond Jubilee year to make the London hospitals independent of private charity! I fear the sum needed will be enormous."

These words written by Lord Lister in 1897 were quoted by the Duke of GLOUCESTER presiding at a meeting of the general council of King Edward's Hospital Fund for London on Dec. 11. He said that Lord Lister, who later became the first chairman of the distribution committee of the Fund, was thinking of the instability of charitable institutions dependent upon uncertain support. The picture for hospitals was now very different, but the day was still very distant when they would be able to dispense with the encouragement which voluntary help could give. Every management committee had a long list of things it would like to see done, many of which would not for many years, if ever, be included in the official programme, unless leagues of friends and voluntary bodies like the King's Fund were there to help. Secondly, the Fund had always been concerned with the setting of standards, and what in its early days was called "efficiency"; and latterly in recent years it had been able to help by setting up such well-established and widely appreciated services as the Nursing Recruitment Service and the Emergency Bed Service, and by establishing staff colleges which had already become an accepted feature of the hospital world. The power of the purse, which used to loom so large when hospitals depended on maintenance grants from the Fund, was now being used in a very different way to bring the best practices to the notice of all.

A report presented by Sir ARCHIBALD GRAY, as chairman of the distribution committee, showed grants of £260,000 during the year, and the council resolved that about £391,000 be set aside for grants to hospitals and convalescent homes, and for maintaining various services and educational activities in 1960.

Over 2550 member of hospital staffs have attended courses lasting more than a fortnight, and in some cases lasting one, two or three years, at the Fund's three staff colleges and school of catering.

University of London

Prof. A. V. Neale has been appointed Heath Clark lecturer for 1961.

University of Leeds

Dr. D. B. Clayson and Dr. J. W. Jull have been appointed lecturers in the department of experimental pathology and cancer research.

University of Oxford

On Dec. 12 the degree of B.M. was conferred on the following:

R. H. Lindenbaum, A. J. Smith, R. J. Robinson, H. J. Tollinton, Hugh Champney, D. C. Lyon, P. M. Riisager, A. V. Hoffbrand, R. A. Lee, A. M. G. Bantock, M. J. Cross, M. I. S. Keir, R. L. W. Cleave, E. H. Jarvis, J. R. R. Spurrell, J. M. H. Buckler, C. R. J. Hawke, H. M. Drake, C. R. T. Hughes, W. M. Russell, J. S. Manners, P. L. Strong, J. V. S. Pether, R. J. Adam, T. D. Hennessey, D. P. B. Goldberg, R. G. Ainley, A. J. Hayward, D. H. Gath, Norah Webb, Pamela J. Ashley, Aline S. Winter, J. F. Young (in absentia).

University of Aberdeen

On Dec. 16 the following degrees were conferred:

M.D.—George Innes, Jane H. Thompson.
M.B., Ch.B.—D. S. Barrit, R. M. Buchan, D. G. Dawson, I. I. Macaulay, Mary E. F. Macpherson, Sybil E. G. Simpson.

University of Dublin

On Dec. 10 the following degrees were conferred:

M.D.—Betty E. Wallace.
M.A.O.—C. R. Deuchar, Olusola Adewole Ojo.
M.B., B.Ch., B.A.O.—B. S. Brewster, Choo Lin Cheah, Alice V. Cunningham, R. H. G. Fisher, I. M. P. Scott-Fleming, Barbara A. Gillespie, R. de G. Hanson, Edward Harris, Wyn Rhys-Jones, Sheila M. Kirwan, J. E. G. Lee, Hwee Leng Lim, Anna Z. Mitko, J. B. Montgomery, F. K. Mulvenna, Maud M. C. Staveley-O'Carroll, Pauline A. O'Loughran, Alicja Piskorska, C. O. S. Smith, E. A. M. Reid-Smith, Ann Stokes, I. P. Burges Watson, J. H. White.

Royal College of Surgeons of England

AT a meeting of the council on Dec. 10, with Sir James Paterson Ross, the president, in the chair, Dr. Charles Huggins (Chicago) was admitted to the honorary fellowship and Prof. A. G. R. Lowdon was admitted to the fellowship *ad eundem*.

Sir Russell Brock was appointed the Hunterian orator for 1961, Sir Stanford Cade the Bradshaw lecturer for 1960, and Mr. Terence Ward the Charles Tomes lecturer for 1960. The Blane medal was presented to Surgeon Commander J. Glass, R.N., the Hallett prize to Dr. Hameed Ud-Din Ahmed, and the Begley prize to Dr. Lydia M. Hayes.

Diplomas of fellowship were granted to the following:

Stanislas Silbermann, D. G. H. Hollis, J. V. Jeffs, S. H. Richards, D. K. Williams, J. T. Newton, Alan Fletcher, R. A. Carpenter, Raphael Chukudile Okoye Eruchalu, Una K. Merrill, Samareswar Bhattacharya, P. T. Clover, Niranjan Das Aggarwal, A. P. Crawford, J. L. M. De Beaux, W. M. Roberts, T. B. Smith, D. W. Hill, A. C. Hume, Mary A. C. Jones, B. C. Abernethy, Ajit Kumar Mukherjee, Balasubramaniam Yoganathan, D. M. Amerasinghe, J. S. W. Chambers, M. J. Flood, N. W. Struthers, C. U. Webster, W. R. Allan, T. D. Anderson, Kenneth Chambler, Bernard Crymble, Barindar Kumar Datta, Sath Paul Dhanda, R. E. Dunstan, Wellege Hemachandra Fernando, F. H. Garlick, K. G. Kling, J. A. McArthur, Donald McIntyre, Hans Raj Manchanda, Virendra Mohan, E. J. Van Heerden, Amarajeeva Wijesinghe, J. D. Abrams, J. B. Anchen, N. S. Buckmaster, B. H. Day, D. S. Gibson, Chintaman Govind Godbole, Brijlal-Chananram Gupta, Rupert Indar, Kanaya Harchandrai Jagasia, Parshottam Sahai Mathur, Vinodrai Ishwardas Mehta, K. K. Merten, Asit Ranjan Paul, F. F. Sandor, Hiralal Vadilal Shah, Shantilal Bhimshi Shah, Surendra Mohan Singh, Pradyot Ramniklal Thakore, Surendra Ambalal Trivedi, John Watson-Farrar, Mohamed Samir Abou-Zeid, J. M. Calvert, J. P. Coutts, J. D. Harris, Sumant Jayachand Kumbhani, Umakant Sharan, M. M. Sinclair, J. G. Smith, Ashok Kumar Maganlal Thakkar, J. W. McK. Upjohn, P. Chitambaranathan Vanniasingham, A. J. Webb, W. J. Cook, D. J. Dundee, John Fenwick, G. D. Fielding, K. J. Hadley, A. R. Kushlick, R. J. Luck, G. R. McLeish, H. S. Millar, Keith Norcross, Mutyam Venkateswara Sarma, P. R. Scott, P. R. Shires, R. V. Thompson, H. K. F. Wilson, Birinder Singh Brara, F. H. D. Breslin, N. L. Browse, P. T. Bruce, Eileen R. Busby, Rajindar Parkash Dhawan, H. J. Espiner, F. J. Harvey, L. E. Hughes, Jagdish Ramnath Jaju, E. L. Judkowski, Peter Kudelka, Ravindra Nath Sharma, Rishi Kumar Shrivastava, Peter Stallabrass, A. E. Thompson, Sushil Kumar Warma, J. E. A. Wickham, M. A. Freeman, L. M. Roberts.

A diploma of fellowship in the Faculty of Anæsthetists was granted to A. G. El-Gohary.

On Thursday, Jan. 14, at 5 P.M., at the college, Lincoln's Inn Fields, London, W.C.2, Sir Walter Mercer will give a Robert Jones lecture. He will speak on some Edinburgh pioneers in orthopædic surgery.

Royal Faculty of Physicians and Surgeons

Sir Gordon Gordon-Taylor will give the Fleming lecture at the faculty, 242, St. Vincent Street, Glasgow, C.2, on Wednesday, Jan. 13, at 5 P.M. The title of the lecture will be Mars and Æsculapius.

Institution of Electrical Engineers

Medical Electronics Discussion Group.—On Friday, Jan. 8, at 6 P.M., at the institution, Savoy Place, London, W.C.2, Prof. R. F. Woolmer and Mr. D. W. Hill will open a discussion on electrical and electronic techniques in respiratory research.

International Congress of Neurological Surgery

This congress will be held in Washington from Oct. 14 to 1961. Further particulars may be had from Dr. B. S. R 525, East 68th Street, New York 21, N.Y., U.S.A.

Radioactive Materials and the Skeleton

The Bone and Tooth Society will hold an all-day meeti on this subject on Jan. 13, starting at 11 A.M., at the Ro College of Surgeons of England, Lincoln's Inn Fiel London, W.C.2.

International Convention of Lifesaving Techniques

This convention will be held in Sydney, from March 12 21. There will be sections on the scientific aspects of drowni and artificial respiration during and after rescue, and t hazards of dangerous marine creatures. Further particul may be had from the secretary of the convention, Postgradu Medical Foundation, 131, Macquarie Street, Sydney, Australi

International Congress of Gastroenterology

This congress will be held from April 20 to 24 at Leid and Noordwijk aan Zee. The two main themes of the congre will be pathology, pathological physiology, and clini aspects of the small intestine; and hepatitis, cirrhosis hepat and their possible connection. Further particulars may be h from the secretary of the congress, 16, Lange Voorhou The Hague, the Netherlands.

Royal Medico-Psychological Association

A Maudsley lecture course will be held at 1, Wimpole Stree London, W.1, on Monday and Tuesday, Feb. 8 and 9. Th speakers will be Dr. Kenneth Cameron, Dr. Henry Wilso Dr. George Sutherland, Dr. Grey Walter, Dr. Alick Elitho Prof. Erwin Stengel, Dr. William Sargant, and Dr. Walt Maclay. Further particulars may be had from the secreta of the association, 11, Chandos Street, W.1.

Scientific Study of Mental Deficiency

A conference on this subject, sponsored by the Americ Association on Mental Deficiency, the Royal Medico-Psych logical Association, the Royal Society of Medicine, the Briti Psychological Society, and the National Association fo Mental Health, will be held at B.M.A. House, Tavistoc Square, London, W.C.1, from July 24 to 29. Further particu lars may be had from the conference secretary, 39, Quee Anne Street, W.1.

Queen Elizabeth Hospital, Birmingham

Plans for extensions to this hospital, which will cost ov £1 million, include a six-storey wing for a new radiotherap department, extension of the clinical research block to provid additional facilities for the treatment of rheumatic disease and a hall of residence for 60–70 postgraduate students an research workers (*Birmingham Post*, Dec. 12). Though n appeal for funds has been made, offers amounting to £388,00 have been received, mainly from Midland firms, but includin £100,000 from an anonymous donor. The Ministry of Healt will contribute £500,000, and the governors' endowment fun will also make a grant. Work is expected to begin in April.

Marie Curie Memorial Foundation

At the annual general meeting of this Foundation on Dec. it was announced that during 1958–59 premises for homes ha been bought in Liverpool, Penarth, and Caterham. These wi increase the Foundation's beds to over 300. A geographica survey of mortality-rates from cancer and population densit in different areas has shown that the greater need for home now lies in the Midlands, South East England, and Northern Ireland, and their programme for the opening of homes will b based on these findings. Welfare grants for cancer patients no cover practically every county in England and Wales, many parts of Scotland, and one or two places overseas. The day- and-night nursing service is proving of value to patients being nursed at home and to the district nurses. Last year the Foundation's income rose by £12,000 to slightly over £300,000. The address of the Foundation is 124, Sloane Street, London, S.W.1.

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THE LANCET

No. 7113 LONDON SATURDAY 26 DECEMBER 1959 VOL. II FOR 1959

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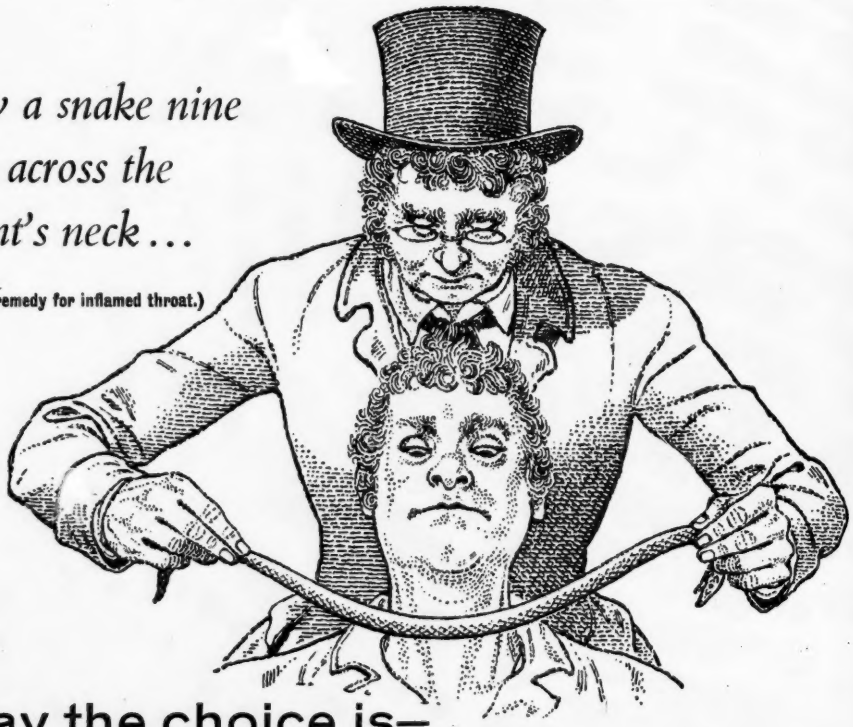

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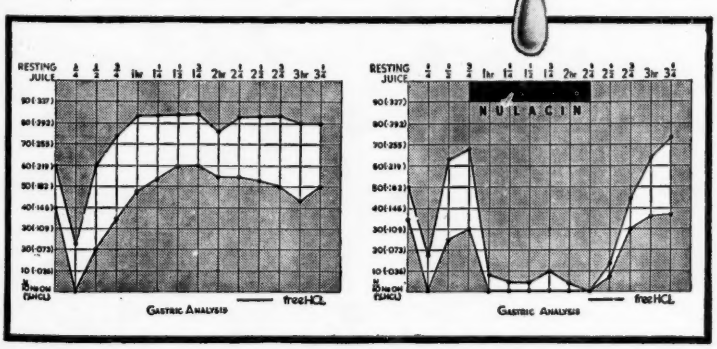

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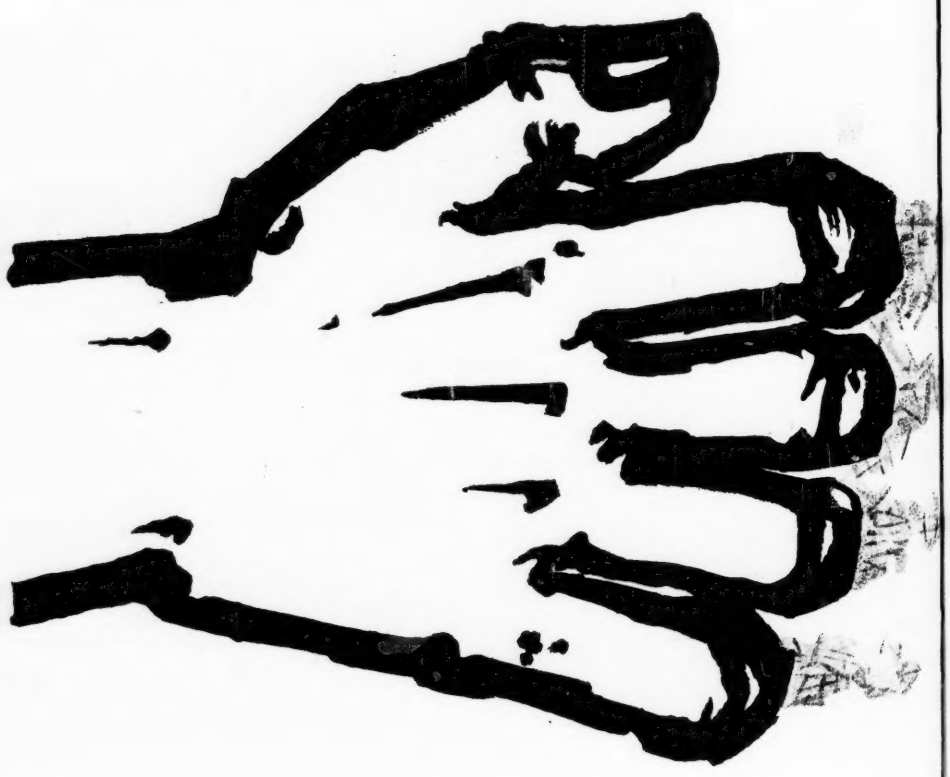

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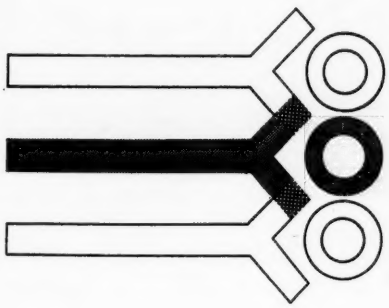

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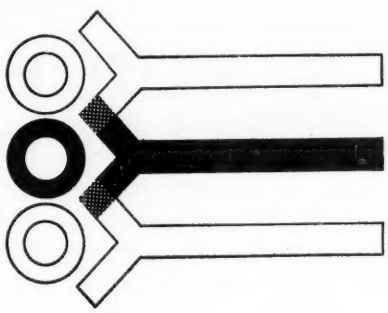

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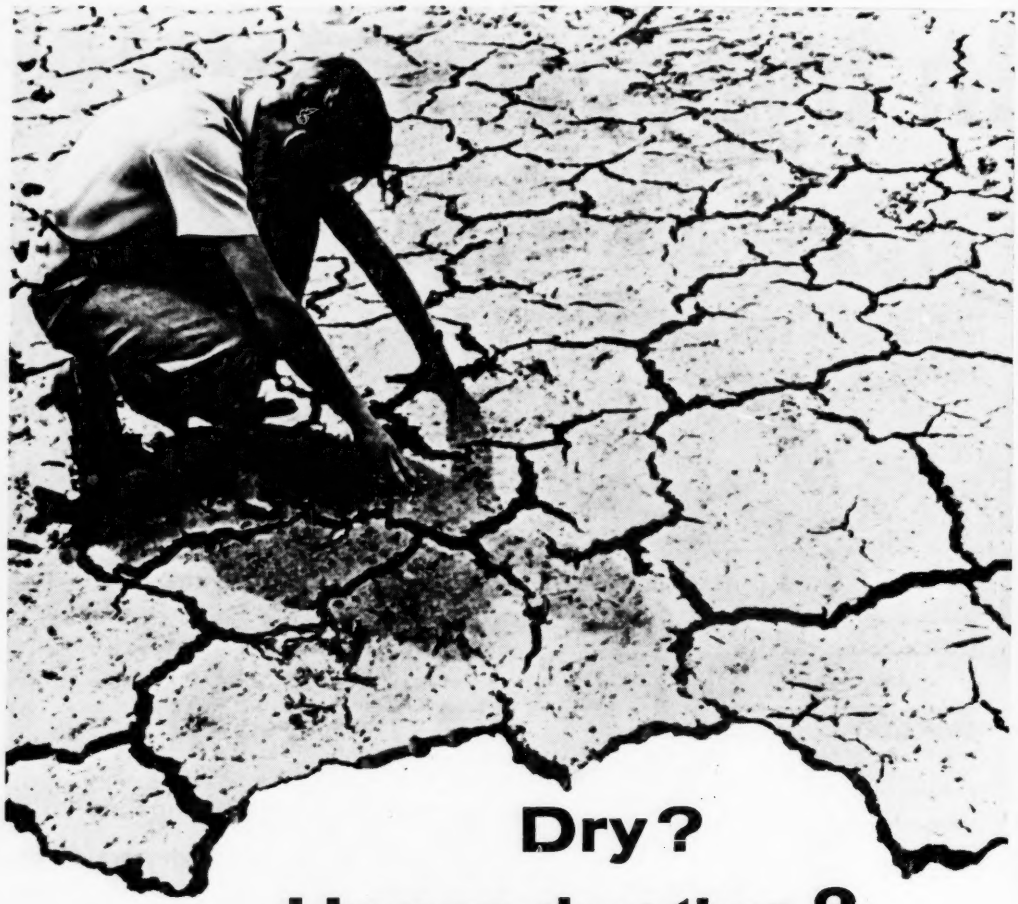

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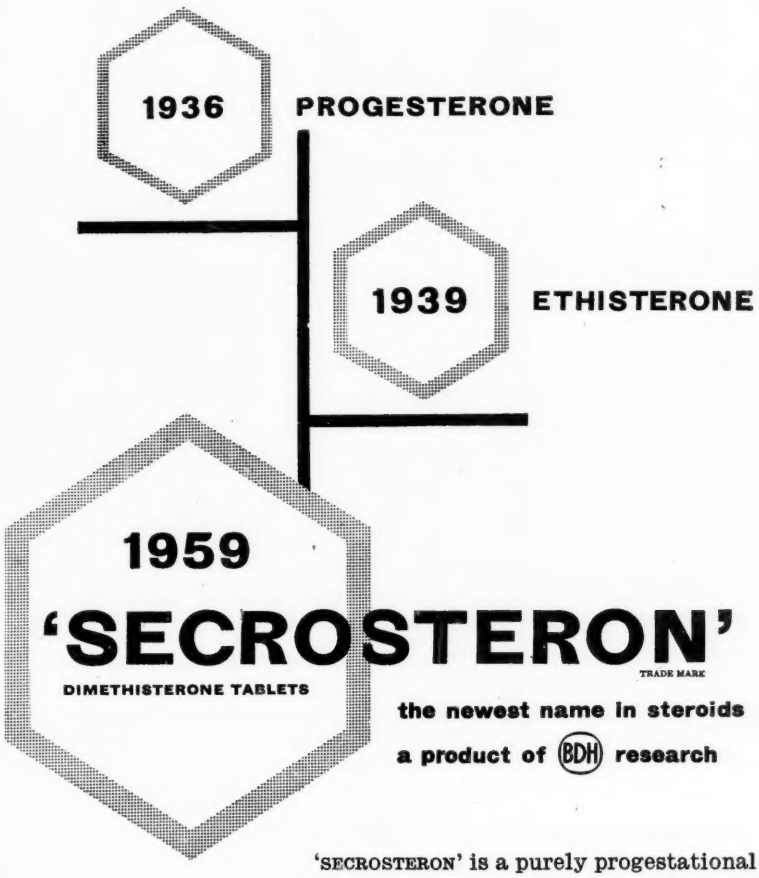

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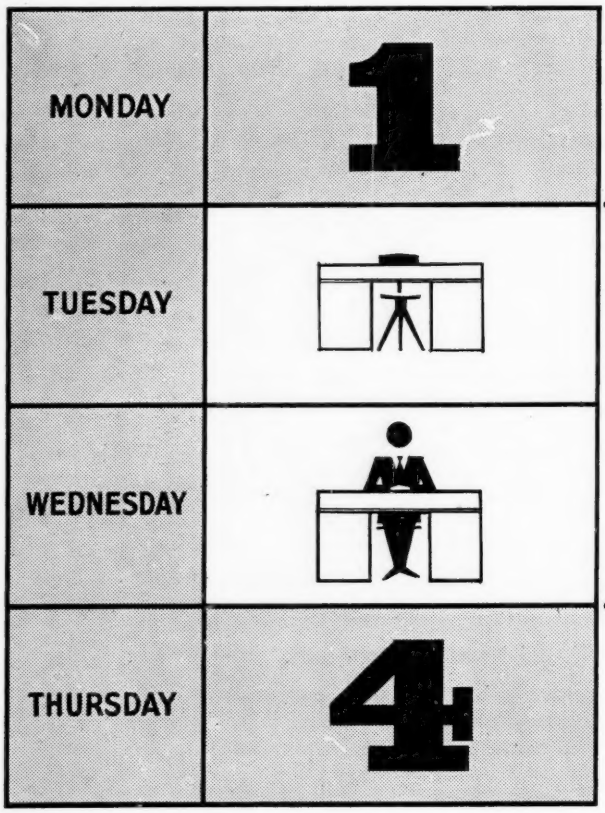

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Academic and Educational

FACULTY OF ANÆSTHETISTS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

EXAMINERSHIPS

The Council of the College invite applications for the following Examinerships :—

FELLOWSHIP IN THE FACULTY OF ANÆSTHETISTS	*Number to be elected*	*Number who seek re-election*
PRIMARY EXAMINATION		
* Anatomy	2	2
* Physiology	2	2
* Pathology	2	2
* Pharmacology	2	1
FINAL EXAMINATION		
† Medicine	1	0
‡ Anæsthetics	8	6

* Applicants must hold a medical qualification registrable in this country.
† Applicants must hold a higher degree or diploma in Medicine.
‡ Applicants must be Fellows in the Faculty.

Forms of application may be obtained from the Secretary, Faculty of Anæsthetists, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2, and must be returned to him by 22nd January, 1960.

R. S. JOHNSON-GILBERT,
Secretary, Faculty of Anæsthetists.

ROYAL COLLEGE OF SURGEONS

CARDIO-RESPIRATORY FUNCTION

A 5½-DAY COURSE in the measurement of cardio-respiratory function during anæsthesia and surgery will be given by the Department of Anæsthesia during the week beginning 22ND FEBRUARY, 1960. It will consist of lectures, demonstrations and practical work. Participants will be limited to 15, and the fee will be 10 guineas.

Further particulars may be obtained from Professor RONALD WOOLMER, Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, and applications should be sent to him not later than 18th January, 1960.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

ACADEMIC POSTGRADUATE DIPLOMA IN BACTERIOLOGY OF THE UNIVERSITY OF LONDON

The COURSE for the Postgraduate Diploma in Bacteriology for the session 1960–61 will commence in OCTOBER, 1960. This is a full-time day course extending over 1 academic year. Fee for the course £73 10s. (including the School registration fee of £3 3s.).

The course may be taken by :—

(*a*) Graduates in medicine, science, or pharmacy of this or another approved university, whose previous training has, in the opinion of the university, fitted them to profit by the course.

(*b*) Registered medical practitioners and other students who, though not graduates, have obtained a qualification and undergone a previous training which, in the opinion of the university, has fitted them to profit by the course.

Applications for admission to the Diploma course must be received not later than 1st March, 1960.

Further information and application forms can be obtained from the Registrar, London School of Hygiene and Tropical Medicine, Keppel-street (Gower-street), London, W.C.1.

UNIVERSITY OF LONDON

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
(incorporating the teaching facilities of Queen Charlotte's Maternity Hospital ; Chelsea Hospital for Women and the Department of Obstetrics and Gynæcology at Hammersmith Hospital)

Applications are invited from graduates with a registrable qualification for enrolment for the SPRING TERM (29TH FEBRUARY–28TH MAY, 1960). Graduates attend each of the constituent hospitals in turn for clinical work, and attend lectures and special demonstrations in all 3 hospitals. Enrolment fee £3. Tuition fee £36 a term.

General practitioners wishing further experience in obstetrics may be accepted to attend the course at Queen Charlotte's Maternity Hospital for shorter periods—i.e., 2–4 weeks. They will have the opportunity of attending the labour ward in addition to combined classes of lectures and demonstrations at the 3 hospitals of the Institute. Ministry of Health grants are payable to approved General Practitioners attending for a period of 1 or 2 weeks.

An INTENSIVE COURSE for those preparing for M.D. and M.R.C.O.G. will be held from 30TH MAY to 13TH JUNE, 1960.

During the Winter vacation, a limited number of graduates may attend the practice of the Hospital.

Hostel accommodation is available at Queen Charlotte's Hospital and at Hammersmith Hospital.

Further particulars can be obtained from the Secretary, Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

UNIVERSITY OF LONDON

(BRITISH POSTGRADUATE MEDICAL FEDERATION)
INSTITUTE OF NEUROLOGY
(Queen-square)

2 COURSES OF CLINICAL DEMONSTRATIONS open to Postgraduates will be held at The National Hospital, Queen-square, on WEDNESDAYS at 4.15 P.M. from 6TH JANUARY to 23RD MARCH, 1960, inclusive, and on SATURDAYS at 10.30 A.M. from 9TH JANUARY to 26TH MARCH, 1960 inclusive.

The fee for attending either of these courses is 2 guineas.

Application for a ticket should be made to the Dean, Institute of Neurology, The National Hospital, Queen-square, W.C.1, and a remittance to cover the fee enclosed. Only postal applications will be considered.

INSTITUTE OF ORTHOPÆDICS

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL
234, Great Portland-street, London, W.1

PROVISIONAL PROGRAMME

A COURSE OF LECTURES on Congenital Disorders of Bones and Joints will be given in the Lecture Room on FRIDAYS from 6 P.M. to 7 P.M. on the following dates :—

8th Jan.	Genetic Factors in Orthopædic Conditions	Dr. C. O. CARTER
15th Jan.	Bone Growth	Dr. H. A. SISSONS
22nd Jan.	*Bone Dystrophies	Mr. H. J. BURROWS
29th Jan.	Congenital Dislocation of the Hip	Mr. H. J. SEDDON
5th Feb.	Hydrocephalus and Spina Bifida	Mr. R. CAMPBELL CONNOLLY
12th Feb.	Talipes	Mr. A. T. FRIPP
19th Feb.	Syndactylism	Mr. R. L. G. DAWSON
26th Feb.	Epiphyseal Dysplasia ..	Mr. D. TREVOR
4th March	Congenital Scoliosis and Kyphosis	Mr. C. W. MANNING
11th March	Radiology of Congenital Skeletal Anomalies	Dr. E. H. ALLEN

*This lecture only will commence at 6.15 P.M.

The fee for the full course will be 3 guineas, or for a single lecture 7s. 6d.

Tickets may be obtained on application to the Dean, at 234, Great Portland-street.

SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 11TH JULY, 1960. The following Examination will be held in DECEMBER, 1960.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE

THE TAVISTOCK CLINIC

INTRODUCTORY COURSE ON PSYCHOLOGICAL PROBLEMS IN GENERAL PRACTICE

A Course of Discussion Meetings for a limited number of general practitioners will commence in JANUARY on WEDNESDAYS from 2 to 4 P.M. Admission is free.

Apply in writing to Medical Director, Tavistock Clinic, 2, Beaumont-street, London, W.1.

UNIVERSITY OF MANCHESTER

DEPARTMENT OF EDUCATION OF THE DEAF

A COURSE for a limited number of Medical Officers engaged in the Public Health Service will be held in the Department of Education of the Deaf from 23RD to 26TH FEBRUARY, 1960, inclusive. Subjects of the course will include the principles and practice of screening tests of hearing, procedures for the assessment of residual capacity to hear in young children and home guidance to the parents of deaf children. The fee for the Course will be £4 4s.

Applications should be made to the Director, Department of Education of the Deaf, The University, Manchester, 13.

BRADFORD ROYAL INFIRMARY. (In association with the Bradford Institute of Technology.) RESEARCH ASSISTANT, preferably with biochemical, biophysical or physiology training. Required to join a team engaged in research on the problem of intervertebral disc, herniation and degeneration. Full-time. Salary in range £800–£1000 p.a., dependent upon experience. Appointment for 1 year in first instance, renewable up to a period of 3 years.

Applications to Secretary, Royal Infirmary, Bradford.

NEWCASTLE REGIONAL HOSPITAL BOARD. Geriatric UNIT, GENERAL HOSPITAL, SUNDERLAND. NUFFIELD RESEARCH FELLOWSHIP for clinical research into problems of ageing. Whole-time appointment for 1 year initially. Salary £1103 19s. p.a. Previous experience of research desirable but not essential.

Applications, with names and addresses of 2 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 21 days.

UNIVERSITY OF ABERDEEN. Department of BIOLOGICAL CHEMISTRY. Applications are invited for the post of LECTURER. Salary on scale £900–£1650, or if medically qualified, £900–£1900, with appropriate placing on either scale. F.S.S.U. and child allowance.

Particulars from the Secretary, The University, Aberdeen, with whom applications (8 copies) should be lodged by 8th January, 1960. Applicants outside the British Isles may submit 1 copy of application.

UNIVERSITY OF GLASGOW. Applications are invited for a LECTURESHIP IN CHILD HEALTH. Salary according to placement on University scale for clinical teachers. The final maximum is £1900 p.a. F.S.S.U. and family allowance benefits.

Applications (12 copies) should be lodged, not later than 15th January, 1960, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

UNIVERSITY OF ST. ANDREWS. Applications are invited for a LECTURESHIP IN BIOCHEMISTRY in the Department of Surgery, Queen's College, Dundee, University of St. Andrews, the Lecturer to work on problems related to the formation of pre-collagen and collagen in wound healing. Salary scale, £900–£50–£1350–£75–£1650 (efficiency bar £1350). Placing on scale according to qualifications and experience, but at stage below efficiency bar. F.S.S.U.; family allowance; grant for removal expenses.

Applications (6 copies), with names of 3 referees, to the undernoted not later than 16th January, 1960.

PATRICK CUMMING, Joint Clerk to the University Court.
Queen's College, Dundee.

THE UNIVERSITY OF LIVERPOOL. Applications are invited for the post of LECTURER or ASSISTANT LECTURER in the Department of Pathology. The initial salary for a Lecturer will be within the range £1200–£1600 p.a.; the salary range for an Assistant Lecturer is £900–£1000 p.a., according to qualifications and experience.

Applications, stating age, academic qualifications and experience, together with the names of 3 referees, should be received not later than 16th January, 1960, by the Registrar, from whom further particulars of the conditions of appointment may be obtained, quoting Reference CV/L.

UNIVERSITY OF QUEENSLAND. Applications are invited for the position of LECTURER IN PHYSIOTHERAPY (Male or Female). Applicants should be members of the Chartered Society of Physiotherapy, and preferably have teaching experience. Salary £A1540/£A2040 p.a.

Further particulars and application forms are obtainable from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1, or from the Registrar, University of Queensland, Brisbane, Queensland, Australia. Applications close, in Australia and London, on 30th January, 1960.

MEDICAL RESEARCH COUNCIL/WORLD HEALTH ORGANIZATION/INDIAN GOVERNMENT TUBERCULOSIS CHEMOTHERAPY CENTRE, MADRAS. The post of SENIOR MEDICAL OFFICER AND DIRECTOR of this project will become vacant in 1960, and the Medical Research Council, on behalf of the World Health Organization, wish to obtain a man of first-class attainments to fill it. The Centre, for which the Council have scientific responsibility, was started in 1956 and is in a fully productive state of research development. In addition to an outpatient clinic, it has a well-equipped routine and research laboratory, a statistical department, and a sanatorium unit. Therapeutic trials are being made on the best forms of domiciliary chemotherapy for tuberculosis in the Indian setting; studies are in progress also on the epidemiology of the disease in contacts and on many laboratory questions. The results are expected to be of benefit in solving certain outstanding tuberculosis problems, not only in India but generally. The candidate must have initiative and drive; be interested in clinical and epidemiological research; have experience in the social and preventive, as well as clinical, aspects of tuberculosis; be able to direct a large staff; and be prepared to do some postgraduate teaching. He should be aged under 50 and must have a higher medical qualification. The successful candidate will be employed by World Health Organization by contract for 2 years in the first instance, probably extendible to 1966. Salary $7300, income tax-free under the usual World Health Organization arrangements, with yearly increments of $225. In addition, there are certain local and general allowances, e.g., dependant and installation allowances, and educational grants and service benefit on termination, all tax-free. First-class air passages for successful applicant and dependants to India and back. Appointment to start as soon as possible so as to ensure overlap in Madras, and to include initial training in London. It may be possible to arrange for the secondment of the successful candidate if he is at present employed by the National Health Service or the Medical Research Council.

Applications (2 copies), giving age, qualifications, details of experience, and the names of 3 professional referees, should be sent to the Personnel Officer, Medical Research Council, 38, Old Queen-street, Westminster, London, S.W.1, within 2 weeks of the publication of this notice. Candidates placed on the short list will be asked to fill up World Health Organization questionnaires.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

1. CONSULTANT HOMŒOPATHIC PHYSICIAN, 2 half-days a week, Royal London Homœopathic Hospital, Great Ormond-street, W.C.1 (180 Beds).

Applications before 25th January, 1960.

2. CONSULTANT GYNÆCOLOGIST, 3 notional half-days a fortnight, Harrow Hospital, Roxeth Hill, Harrow (120 Beds).

Applications before 27th January, 1960.

3. CONSULTANT E.N.T. SURGEON, 1 half-day a week, Northwood, Pinner and District Hospital, Northwood, Middlesex (36 Beds).

Applications before 1st February, 1960.

Hospitals may be visited by direct appointment.

Application forms, obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, before 1st February, 1960.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as CONSULTANT ANÆSTHETIST (9 notional half-days weekly) to the Canterbury and Isle of Thanet Groups of hospitals. The duties will be shared between the 2 groups, with occasional visits as required to St. Augustine's Hospital. Candidates must have had a wide experience in anæsthetics and hold the qualification of F.F.A. R.C.S. Applicants may visit the hospitals concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, to be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 9th January.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as CONSULTANT ANÆSTHETIST (9 notional half-days weekly) to the Hastings Group of hospitals. Candidates must have had a wide experience in anæsthetics and hold the qualification of F.F.A. R.C.S. Applicants may visit the hospitals concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, to be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 9th January.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of Whole-time CONSULTANT PSYCHIATRIST AND DEPUTY PHYSICIAN-SUPERINTENDENT at Mabledon Hospital in the Darenth and Stone Group of hospitals. Candidates must possess a D.P.M., and a higher medical qualification is also desirable. Psychiatric hospital and outpatient clinic experience is essential, and applicants should have practical knowledge of modern psychiatric therapeutic procedures, including psychotherapy and occupational therapy. A small flat only is available, but the successful candidate need not be resident. Candidates may visit the hospital.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, by not later than 9th January, 1960.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as CONSULTANT in General Pathology (whole-time or 9 notional half-days weekly) to the Medway and Gravesend Group of hospitals. Duties will be mainly in clinical pathology at St. Bartholomew's Hospital, Rochester. Candidates must have had wide experience in pathology, and a higher university degree or membership of a Royal College of Physicians is desirable. Applicants may visit the hospitals concerned.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, to be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, by not later than 16th January.

DUBLIN. ST. LAURENCE'S HOSPITAL. Applications are invited for the post of PHYSICIAN-IN-CHARGE, Department of Physical Medicine.

Particulars may be obtained from the Secretary, to whom applications should be forwarded before 31st January, 1960.

LEEDS REGIONAL HOSPITAL BOARD.

Geriatrics

Whole-time ASSISTANT GERIATRICIAN (Senior Hospital Medical Officer scale) for duties at hospitals in the Leeds A and B Groups (906 Beds). The successful candidate will work under the Consultant Geriatrician, and will be required to reside in or near Leeds. There is an organised Area Geriatric Service in existence. The post offers good experience to candidates of Senior Registrar (or equivalent status) in general medicine who may decide to specialise in geriatrics, and there are excellent opportunities for gaining experience in rehabilitation and physical medicine.

Psychiatry

CONSULTANT PSYCHIATRIST AND DEPUTY PHYSICIAN-SUPERINTENDENT (whole-time), Naburn and Bootham Park Hospital, York. Applications are invited from suitably qualified candidates for this post based on Naburn Hospital, York, where a detached house is available. Naburn has 455 Beds. Considerable structural alterations are in progress. 2 modern admission units have already been completed, as also has an entirely new Social Centre. Naburn forms, with Bootham Park (202 Beds), a compact, active psychiatric hospital, which is an integral part of the York Mental Health Service. Particular stress is laid upon liaison with social workers in the community, and the person appointed will be expected to play a part in these activities, and also in the outpatient clinics and services. Candidates are welcome to inspect the hospital, and may do so by arrangement with the Physician-Superintendent, Bootham Park, York.

Applications (12 copies), stating age, qualifications, and details of present and previous appointments with dates, and names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 25th January, 1960.

LIVERPOOL REGIONAL HOSPITAL BOARD. Ormskirk COUNTY HOSPITAL. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) with duties on the psychiatric wards at the above hospital and outpatient clinics served by the hospital. Applicants should possess the D.P.M. and have reasonable experience in psychiatry, including practical knowledge of outpatient work.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 55, Castle-street, Liverpool, 2, to be returned not later than 16th January, 1960.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time additional CONSULTANT PATHOLOGIST to the Oldham and District Hospitals Group Laboratory at Oldham and District General Hospital. Special interest in bacteriology and biochemistry desirable. Wide experience in hospital pathology desirable. Appointee to live in or near Oldham.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 4th January, 1960.

SHEFFIELD REGIONAL HOSPITAL BOARD. CONSULTANT PHYSICIAN with experience in paediatrics (maximum part-time), for hospitals in the Boston and Grantham area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 16th January, 1960.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT RADIOTHERAPIST required for the Leicester area. Main duties at the centre associated with the Leicester Royal Infirmary.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 16th January, 1960.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST at the Scawcho Road Hospital, Grimsby, and duties with the Local Health Authority. Salary scale £1719 18s.–£54 12s.–£2211 6s.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd January, 1960.

SOUTH WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time appointment of CONSULTANT PSYCHIATRIST to the South Somerset Clinical Area. Applicants should possess a higher qualification in medicine and the D.P.M., and experience in the clinical aspect of encephalography is desirable. The successful candidate, whose work will be based on Tone Vale Hospital, will be required to work generally in the South Somerset Clinical Area, undertaking outpatient clinics at the general hospitals and assist in the development of the psychiatric work of that area in association with the local authority.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 16th January, 1960.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the following appointments:—

DEPUTY SENIOR ADMINISTRATIVE MEDICAL OFFICER. Salary scale £2020 4s.–£109 4s. (5)–£2566 4s. The successful applicant will be required to deputise for the Board's Senior Administrative Medical Officer and carry out such duties as may be assigned to him in connection with the planning, organisation and staffing of the hospital and specialists services in the Welsh region.

ASSISTANT SENIOR ADMINISTRATIVE MEDICAL OFFICER. Salary scale £1834 12s.–£87 7s. (4)–£109 4s.–£2293 4s. The duties of the post will be concerned with the planning and organisation of the hospital and specialists services in the Welsh region and such other duties as may be assigned by the Board's Senior Administrative Medical Officer.

The appointments are subject to the Whitley Council terms and conditions of service.

Applications, stating post applied for, qualifications and experience, and the names of 3 referees, should be sent to the Secretary, The Temple of Peace and Health, Cardiff, to be received not later than Thursday, 31st December, 1959.

WESSEX REGIONAL HOSPITAL BOARD requires a Whole-time or Maximum Part-time CONSULTANT PATHOLOGIST for the Southampton Group of hospitals. The successful candidate will be responsible for the hospital bacteriology work in the Group, and candidates should have had considerable experience in this branch of the specialty. Candidates may visit the hospitals by arrangement with the Group Secretary, Tremona-road, Shirley, Southampton. Residence within 10-mile radius of Southampton is a condition of the appointment.

Applications (7 copies), stating age, qualifications and experience, with the names and addresses of 3 referees, to the Secretary, Highcroft, Romsey-road, Winchester, by 16th January, 1960.

CANADA. UNIVERSITY OF ALBERTA HOSPITAL, EDMONTON, ALBERTA, CANADA. (Over 1000 Bed capacity.) Required, qualified PHYSIATRIST for large modern Rehabilitation Department in the above Hospital. Salary schedule $10,000–$12,000 p.a., with specialist qualifications. Allowed private practice to the amount of $3000 p.a.

Apply to Dr. M. T. CARPENDALE, Director of Rehabilitation, giving curriculum vitæ and references in first letter.

U.S.A. LOVELACE CLINIC, situated in Albuquerque, NEW MEXICO, U.S.A., is expanding its staff and needs qualified SPECIALISTS in the field of orthopædics, eye, ear, nose and throat, and anæsthesia.

Write directly to H. A. REID, Lovelace Clinic, Albuquerque, New Mexico.

Hospital Services: Junior Appointments

CENTRAL MIDDLESEX HOSPITAL, Park Royal, London, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time) required in General Medical and Cardiological Department. Opportunity for research work. Resident when on duty. Appointment for 1 year and renewable. Hospital may be visited by direct appointment.

Application forms from and returnable to Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, London, N.W.10, by 2nd January.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, London, N.W.10. REGISTRAR (whole-time) required in Obstetrics and Gynæcology, resident or non-resident, post recognised for M.R.C.O.G. The department consists of 84 obstetrical beds, 50 gynæcological beds, and a large Outpatient Department. Post vacant middle February. Applicants may visit Hospital by direct appointment. Appointment subject to terms and conditions of service of hospital and medical staff.

Application forms from and returnable to Group Secretary by 30th December.

CHINGFORD HOSPITAL, London, E.4. (104 Beds.) RESIDENT HOUSE PHYSICIAN required for 6 months with duties at other hospitals in the Group. Post vacant 16th February, 1960.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE SURGEON required for 6 months. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE PHYSICIAN required for a period of 6 months. Post vacant 6th January, 1960.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

COLINDALE and EDGWARE GENERAL HOSPITALS. SENIOR HOUSE SURGEON for E.N.T. Department, resident, required at above Hospitals. Post recognised for F.R.C.S. and D.L.O. purposes.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to Group Secretary, Edgware General Hospital, Edgware, Middlesex, by 9th January, 1960.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. ORTHOPÆDIC HOUSE SURGEON, Senior House Officer grade. Some E.N.T. and emergency general surgery. New operating-theatre, Outpatient and Casualty Department.

Applications, with copies of recent testimonials and name and address of 1 referee, to Hospital Secretary.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. Applications are invited from pre- or post-registration medical practitioners for post of HOUSE SURGEON. Now vacant. 50 surgical beds. New operating-theatre, Outpatient and Casualty Departments.

Applications, with 2 testimonials and name and address of 1 referee, to Hospital Secretary.

KING EDWARD MEMORIAL HOSPITAL, Ealing. Senior HOUSE OFFICER required 1st February, 1960, for duty in Casualty and Orthopædic Departments. Recognised for 6 months' casualty work for F.R.C.S. Resident or non-resident.

Applications, giving age, nationality, qualifications and experience, with dates, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 5th January, 1960.

KING'S COLLEGE HOSPITAL BOARD OF GOVERNORS and THE SOUTH-EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SENIOR REGISTRAR in Radiology (Diagnostic), to be made jointly by the bodies concerned, the post to be held at King's College Hospital and in the Woolwich Hospital Group. Applicants should hold a Diploma in Radiology. Preference will be given to those possessing a higher qualification in medicine or radiology. The successful candidate will be expected to spend part of his time in the Regional Board Hospital on an exchange basis.

The appointment, which is tenable from 1st March, 1960, will be for 6 months in the first instance and thereafter renewable annually.

Applications, stating age, education, qualifications and experience, and giving the names of 2 referees, should be sent to the undersigned not later than 9th January, 1960.

S. W. BARNES, House Governor.

King's College Hospital, Denmark Hill, S.E.5.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre- and post-registered medical practitioners for the post of HOUSE SURGEON. Vacant 27th January, 1960. Successful candidate will be asked to carry out locum duties from 14th January, 1960. Appointment recognised for F.R.C.S.

Applications, giving full particulars and enclosing copies of 2 testimonials, to the Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. South West METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of SURGICAL REGISTRAR for General Surgery and Genito-urinary work. The appointment is normally for 2 years but is subject to review at the end of 1 year. The post is resident or non-resident, but if the latter the successful applicant will be required to sleep in on nights on duty.

Forms of application from the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to be returned not later than 16th January, 1960.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st February, 1960, for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar, according to qualifications and previous surgical experience. The post is recognised by the Royal College of Surgeons.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 30th December.

J. ROBBINS, House Governor.

London Chest Hospital, E.2.

MILDMAY MISSION HOSPITAL, Austin-street, Bethnal Green, E.2. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (resident). Recognised for the F.R.C.S. Vacant January, 1960. Candidates should be in full sympathy with the Christian evangelistic aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent.

MILE END HOSPITAL, Bancroft-road, London, E.1. (479 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant 27th January, 1960.

Application form, obtainable from Physician-Superintendent, to be returned by 8th January, 1960, with copies of not more than 3 testimonials.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity, 110 Beds.) Applications from registered practitioners for 2 6-month resident posts, vacant 1st February and 1st April, of OBSTETRIC HOUSE SURGEON (recognised for M.R.C.O.G.) should be sent to Group Secretary, Hackney Hospital, E.8, quoting MH/HO.

MOTHERS' HOSPITAL (Salvation Army), London, E.5. (Maternity, 110 Beds.) Applications for the 6-month resident appointment, vacant 1st March, of Pre-registration OBSTETRIC HOUSE SURGEON (recognised for M.R.C.O.G.) should be sent to Group Secretary, Hackney Hospital, E.9, quoting MH/PHO.

NORTH MIDDLESEX HOSPITAL, London, N.18. Senior HOUSE OFFICER in Anæsthetics, resident, required for 1st February. Appointment is for 6 months in the first instance, with possible extension to 1 year. Hospital is recognised for training for D.A. and F.F.A. R.C.S. Previous experience in anæsthesia is desirable but not essential. Post offers wide experience, particularly in emergency surgery.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 7th January.

NORTH MIDDLESEX HOSPITAL, London, N.18. Senior HOUSE OFFICER for Thoracic Surgical Unit (a Regional Thoracic Centre) required for 6 months. The post, which is resident, is recognised for F.R.C.S. and offers experience in all varieties of cardiac, œsophageal, and non-tuberculous pulmonary surgery.

Applications, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital as soon as possible.

NORTH MIDDLESEX HOSPITAL, London, N.18. Locum REGISTRAR in Pathology required for approximately 6 months, starting 1st February. Non-resident, but required to sleep in Hospital when on duty for emergency work.

Applications, giving full particulars of qualifications and experience, with names of 2 referees, to Secretary of Hospital, as soon as possible.

QUEEN CHARLOTTE'S and CHELSEA HOSPITALS. CHELSEA HOSPITAL FOR WOMEN. HOUSE SURGEON (Senior House Officer). Resident post tenable for 1 year from 1st April, 1960.

Applications to the House Governor by 9th January, 1960, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S and CHELSEA HOSPITALS. QUEEN CHARLOTTE'S MATERNITY HOSPITAL. JUNIOR OBSTETRIC OFFICER (Senior House Officer). Resident post tenable for 6 months from 1st April, 1960.

Applications to the House Governor by 9th January, 1960, on forms obtainable from 339, Goldhawk-road, London, W.6.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL and CHELSEA HOSPITAL FOR WOMEN. Applications are invited from candidates holding M.R.C.O.G. for 1 whole-time and 2 part-time posts, or 3 part-time posts, of SENIOR REGISTRAR tenable in this group from 4th April, 1960. Duties may be at either or both hospitals and candidates for part-time posts must be available for a minimum of 2 sessions and be available on Thursday mornings.

Applications (1 copy), giving full personal details, previous appointments, and the names of 3 referees, should be sent to the House Governor, 339, Goldhawk-road, London, W.6, not later than 16th January, 1960.

QUEEN MARY'S HOSPITAL, Roehampton, London, S.W.15. (370 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (Tropical Unit) required immediately. National Health Service terms and conditions.

Apply Medical Superintendent.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of SURGICAL REGISTRAR. The appointment is for 1 year in the first instance, duties to commence as soon as possible. Candidates should be registered medical practitioners and Fellows of the Royal College of Surgeons.

Applications, together with the names of 3 referees, should be sent to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 2nd January, 1960.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment of ORTHOPÆDIC REGISTRAR (full-time), non-resident. Preference will be given to candidates with a higher surgical qualification. Registrars are liable for secondment to Peace Memorial Hospital, Watford, and/or Barnet General Hospital for periods of 6 months during their tenure of appointment.

Applications to be received not later than 9th January, 1960. Forms of application can be obtained from the House Governor, 234, Great Portland-street, London, W.1.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. (277 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR (second) required at above Hospital. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from and returnable to the Secretary, Royal Northern Hospital, London, N.7, by 9th January, 1960.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of Locum REGISTRAR to the Orthopædic Department for a period of 3 months from 1st January, 1960, or as soon afterwards as possible. The post is non-resident and part-time, 5 sessions per week, and will be graded Registrar or Senior Registrar according to qualifications and experience.

Applications, stating age, education, qualifications, and experience, together with the names and addresses of 2 referees, should be forwarded to the undersigned as soon as possible.

P. H. CONSTABLE, House Governor.

ST. JAMES' HOSPITAL, Balham, S.W.12. Locum House PHYSICIAN required from 1st to 31st January.

Applications, giving full particulars with 2 copy references, to Group Secretary at above address.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. HOUSE SURGEON. Vacant 3rd February. Recognised for pre-registration service and for F.R.C.S.

Applications to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. SENIOR HOUSE OFFICER (casualty). Vacant end of January. There are 2 Senior House Officers in the department, which provides good general experience. 6-month resident appointment and may then be renewed.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment, for 1 year in the first instance, as Whole-time REGISTRAR in General Surgery (resident) to the Seamen's Group of hospitals, for duty mainly at the Dreadnought Seamen's Hospital, Greenwich, S.E.10. Flat adjacent to hospital available for married man. The successful candidate may commence duty on 1st February to serve for 1 month as Locum Tenens pending substantive appointment which will be effective from 1st March, 1960.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 2nd January.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of GYNÆCOLOGICAL HOUSE SURGEON. Vacant 8th February, 1960. Recognised for the M.R.C.O.G.

Application forms from the Secretary.

SOUTH WESTERN HOSPITAL, Landor-road, London, S.W.9. RESIDENT HOUSE SURGEON (Senior House Officer grade) required to take charge of 32 surgical beds under the direction of the Surgical Consultant of Lambeth Hospital, Kennington; also to work under the E.N.T. Surgeon at the South Western Hospital and provide cover for small casualty department. Post recognised for the F.R.C.S. Vacant 18th January, 1960.

Applications by 6th January, 1960, with full details and copies of 3 recent testimonials, to the Hospital Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st March, 1960, for a RESIDENT DENTAL HOUSE SURGEON (Senior House Officer grade). The post is recognised for the Fellowship in Dental Surgery, Royal College of Surgeons. Experience is given in oral surgery and orthodontics.

Further particulars and application form, to be returned by 18th January, 1960, obtainable from the House Governor.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 1st March, 1960, for a HOUSE SURGEON (Senior House Officer grade).

Further particulars and application form, to be returned by 12th January, 1960, obtainable from the House Governor.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 6th March, 1960, for an ASSISTANT RESIDENT MEDICAL OFFICER (Senior House Officer grade) at the Country Branch Hospital, Tadworth, Surrey.

Further particulars and application form, to be returned by 12th January, 1960, obtainable from the House Governor.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a MEDICAL REGISTRAR AND PATHOLOGIST (Senior Registrar). In July, 1962, the successful candidate will probably be seconded to Uganda to work in pædiatrics for a period of 2 years under the Great Ormond-street liaison scheme with the Uganda Medical Service. After this period he will return to Great Ormond-street for a further year.

Further particulars and application form to be returned by 18th January, 1960. Obtainable from the House Governor.

THORPE COOMBE MATERNITY HOSPITAL, Waltham-stow, E.17. (58 Beds.) Applications are invited for the post of HOUSE OFFICER. Vacant 10th February, 1960. The appointment is recognised for D.Obst.R.C.O.G. as an obstetrical post.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, The Green, N.15. RESIDENT OBSTETRIC HOUSE OFFICERS (Senior House Officer) required for Bearsted Memorial Hospital, Lordship-road, N.16, and at The Green, Hampton Court, for 6 months commencing 1st March, 1960. Posts recognised for the D.Obst.R.C.O.G. Previous obstetric experience an advantage. The successful candidates would be expected to act as Locums from 14th to 29th February, 1960, inclusive.

Application form from Secretary to be returned by 11th January, 1960.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of NON-RESIDENT SENIOR HOUSE OFFICER in the Anæsthetic Department for 1 year from 1st February, 1960.

Applications, with names of 2 referees, to T. F. W. MACKEOWN, Administrator and Secretary, by 8th January, 1960.

WEST HENDON HOSPITAL, Goldsmith-avenue, Hendon, London, N.W.9. JUNIOR HOSPITAL MEDICAL OFFICER, full-time, resident, required at the above Hospital of 112 Beds, which caters mainly for infectious diseases, but also has a section for medical cases. Post vacant 29th February, 1960. Successful candidate will be required to work part-time in the Medical Department of Edgware General Hospital, Edgware, Middlesex.

Apply, stating age, nationality, qualifications and details of experience, together with the names and addresses of 2 referees, to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 2nd January, 1960.

WHITTINGTON HOSPITAL, Highgate Hill, N.19. Applications are invited for the post now vacant of TRAUMATIC AND ORTHOPÆDIC REGISTRAR in new unit. The post is eminently suitable for one whose main interest is in orthopædics. Duties will include liaison with Casualty Department (recognised for F.R.C.S.) which is part of this unit.

Application forms obtainable from and returnable to Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley Park, N.6 (ARChway 3070, extension 526/7), within 10 days.

WEST LONDON HOSPITAL, Hammersmith, W.6. Charing Cross Group of Hospitals. The following Resident Senior House Officers required:—

2 CASUALTY OFFICERS, each for 6 months from 18th January, 1960, and 1st February, 1960, respectively. (Recognised for F.R.C.S.)

1 ANÆSTHETIST for 6 months from 18th January, 1960.

The following pre-registration House Officers are required:—

1 RESIDENT HOUSE SURGEON (general and orthopædic) for 6 months from 18th January, 1960.

1 RESIDENT HOUSE SURGEON (general and genito-urinary) for 6 months from 1st February, 1960.

1 RESIDENT HOUSE SURGEON (general and gynæcology) for 6 months from 13th February, 1960.

Detailed applications, with names of 2 referees, to the undersigned by 8th January, 1960.

West London Hospital. J. Condon, Secretary.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1, and Kingston Hospital, 26, Wolverton-avenue, Kingston-on-Thames, Surrey. Joint appointment of SENIOR ANÆSTHETIC REGISTRAR. Applications invited for post which will be vacant from 1st January, 1960. Appointment for 1 year in first instance. Candidates must hold F.F.A. R.C.S.

Applications (14 copies), with names of 3 referees, to reach House Governor, Westminster Hospital, by 5th January.

ABERDARE GENERAL HOSPITAL, Aberdare. (102 Beds.) SENIOR HOUSE OFFICER (surgical). Duties mainly general surgery, orthopædic and traumatic with rota duties in Casualty Department. Married accommodation available.

Apply, with full particulars and copies of 2 recent testimonials, to Group Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil.

ARGYLL AND BUTE MENTAL HOSPITAL, Lochgilphead, Argyll. JUNIOR HOSPITAL MEDICAL OFFICER required. House or flat available. Facilities for study for D.P.M.

Applications, stating age and experience and naming 2 referees, to be sent to the Secretary, Board of Management for Lochgilphead Hospitals, Lochgilphead, Argyll, not later than 9th January, 1960.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (midwifery) required. Post, recognised for D.Obst.R.C.O.G., vacant mid-February, 1960. Bed complement of the department 76 obstetrics and 26 gynæcology. Preference given to pre-registration candidates.

Applications, with copies of 2 testimonials, to Group Secretary, General Hospital, Ashton-under-Lyne, Lancs.

ASHTON-UNDER-LYNE GENERAL HOSPITAL. Senior HOUSE OFFICER, JUNIOR HOSPITAL MEDICAL OFFICER, or HOUSE PHYSICIAN (pædiatrics) according to experience required at above Hospital. Neonatal experience would be especially valuable. Modern pædiatric and premature baby units. Recognised for D.C.H. Vacant mid-January.

Applications, with copies of 2 references, to Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, General Hospital, Ashton-under-Lyne, Lancs.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration) required immediately. The Hospital serves a wide area, and the post affords good opportunity to study excellent clinical material. 3 other resident medical staff.

Applications, naming 2 referees, to Group Secretary, 19, Alexandra-road, Barnstaple.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) SENIOR HOUSE OFFICER required, whose duties will be mainly casualty. Post tenable for 1 year. Small furnished flat available.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEBINGTON, WIRRAL, CHESHIRE. CLATTERBRIDGE HOSPITAL. CENTRAL WIRRAL GROUP. HOUSE OFFICER (pædiatrics). Post available for 6 months, commencing 1st March, 1960, in recognised pre-registration and D.C.H. Unit of 82 Beds. Salary according to previous posts held.

Application forms, obtainable from Secretary, to be returned as soon as possible (537).

BEDFORD GENERAL HOSPITAL. (424 Beds.) House SURGEON required. Pre- or post-registration, recognised for F.R.C.S. Post offers exceptional opportunities for general experience in acute surgical units. Holder of this appointment will be favourably considered for appointment as House Physician at the termination of contract.

Applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (424 Beds.) House SURGEON for Orthopædic and Casualty duties. Pre- or post-registration. Vacant 28th December, 1959. Recognised for F.R.C.S. This post would be convenient for those studying for examinations as it is in easy reach of London and adequate library facilities are available at the Hospital.

Applications, with copies of 2 recent testimonials, to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (424 Beds.) Locum Tenens SENIOR HOUSE OFFICER for Orthopædic and Casualty duties required for indefinite period.

Applications to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford (telephone Bedford 5401, extension 22).

BLACKPOOL. GLENROYD MATERNITY HOSPITAL. (66 Beds.) OBSTETRICAL HOUSE OFFICER. Resident pre-registration post, recognised for the D.Obst.R.C.O.G., vacant in February.

Applications, stating age, experience, and giving the names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham, 3. Registered medical practitioner required for the post of CLINICAL ASSISTANT on Monday, Thursday, and Friday mornings. Diploma in Ophthalmology an advantage.

Detailed applications, naming 2 referees, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. Senior HOUSE OFFICER (anæsthetics), vacant 1st February, 1960. Recognised for D.A. and F.F.A. R.C.S. Extensive experience of anæsthetics not necessary. Duties include list and emergency work in general surgery, gynæcology, obstetrics, and E.N.T. at Group hospitals.

Applications, with 3 recent testimonials, to Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

Mid-Worcester Group, Birmingham-road, Bromsgrove

REGISTRAR (general surgery) for Kidderminster and District General Hospital. Experience specialty essential. Higher qualification desirable. Recognised F.R.C.S. Married accommodation available.

Birmingham (Dudley Road) Group, Dudley Road Hospital, Birmingham, 18

SURGICAL REGISTRAR for St. Chad's Hospital, Birmingham, 16. Resident. 50 general surgical beds. Recognised F.R.C.S. Limited married accommodation available.

West Bromwich Group, West Bromwich and District General Hospital, West Bromwich

REGISTRAR (general surgery) for Hallam Hospital, West Bromwich. (430 Beds.) Resident. Post offers wide surgical experience. Recognised F.R.C.S.

Application forms from Group Secretaries to be returned by 4th January, 1960.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (Equipped beds 1033.) SENIOR HOUSE OFFICER, E.N.T. Department. 42 Beds. Resident. Recognised for F.R.C.S.

Apply immediately, giving age, qualifications and experience, to the Medical Superintendent.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. QUEEN ELIZABETH HOSPITAL. Applications are invited for the resident appointment of HOUSE SURGEON (general surgery) for the period 7th January–6th July, 1960. Recognised for pre-registration candidates but registered medical practitioners may apply.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him immediately.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. QUEEN ELIZABETH HOSPITAL. Applications are invited for the resident appointment of HOUSE PHYSICIAN to the Radiotherapy Department for the period 7th January–6th July, 1960. Recognised for pre-registration candidates but registered medical practitioners may apply.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him immediately.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE GENERAL HOSPITAL. Applications are invited for the resident appointment of HOUSE SURGEON to the Gynæcological Department for the period 7th January–6th July, 1960. Recognised for pre-registration candidates but registered medical practitioners may apply.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him immediately.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, Bishop's Stortford, Hertfordshire. (67 Beds—surgical, medical, and maternity.) RESIDENT SENIOR HOUSE OFFICER (Male) required immediately. Duties mainly surgical. Salary £852 6s. p.a. less £150 in respect of residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, to Hospital Secretary, Herts and Essex General Hospital, Bishop's Stortford, Herts.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.

The Royal Infirmary, Bolton (246 Beds)

RESIDENT HOUSE SURGEONS (2). Vacant 12th and 17th February, 1960. Tenable for 6 months and recognised under pre-registration service scheme. Also recognised for F.R.C.S.

Bolton District General Hospital (605 Beds)

RESIDENT HOUSE SURGEONS (2). Vacant 14th and 22nd March, 1960. Tenable for 6 months and recognised under pre-registration service scheme. Also recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOLTON. THE ROYAL INFIRMARY. (246 Beds.) SENIOR HOUSE OFFICER (resident or non-resident) for Casualty Department with some orthopædic duties. Vacant immediately, tenable for 12 months and recognised for F.R.C.S. Staff of 2 with Consultant supervision and adequate relief. Post offers good casualty/accident experience.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER (casualty and orthopædics). The post, which becomes vacant mid-January, 1960, may be resident or non-resident. The Unit now consists of 3 Senior House Officers and a Registrar. The appointment is recognised for the F.R.C.S. examination.

Applications to the Hospital Secretary.

BOURNEMOUTH AND EAST DORSET GROUP. Wessex REGIONAL HOSPITAL BOARD. REGISTRAR in Geriatrics required for hospitals in the above Group. The successful applicant will be resident at St. Leonard's Hospital, near Ringwood, Hants (where married accommodation is available), and will work under the direction of the Consultant Physician in Geriatrics. The duties will be mainly at Christchurch Hospital and St. Leonard's Hospital.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Shelley-road, Boscombe, Bournemouth, Hants, should be completed and returned by not later than 2nd January, 1960.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT ANÆSTHETIST (Senior House Officer) required 21st January, 1960.

Applications to the Hospital Secretary, Poole General Hospital, Poole, Dorset.

BRIGHTON. BEVENDEAN HOSPITAL, Bear-road, BRIGHTON. Locum JUNIOR HOSPITAL MEDICAL OFFICER required for periods 4th–17th January, 1960, and 14th March–3rd April, 1960. Salary £20 per week.

Applications, stating age, qualifications, and names of 2 referees, to the Administrative Officer, Brighton General Hospital, Elm-grove, Brighton (telephone Brighton 66444), as soon as possible.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the pre-registration appointment of HOUSE SURGEON (orthopædics).

Applications, stating age, qualifications, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) HOUSE PHYSICIAN (pre-registration) required 17th January, 1960.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Eastern-road, Brighton, 7.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of SENIOR HOUSE OFFICER in the Regional Department of Thoracic Surgery (100 Beds) at Frenchay Hospital, Bristol. Post provides experience in cardiac, œsophageal and pulmonary surgery, and is recognised for Fellowship examinations of the Royal College of Surgeons. Tenable for 6 months from January, 1960; renewable by mutual agreement.

Apply to Group Secretary, Frenchay Hospital, Bristol, stating age and experience and naming 2 referees.

BROMLEY HOSPITAL, Bromley, Kent. Senior House OFFICER (anæsthetics), qualified minimum 1 year, for duty at Group hospitals, required for 6 months (renewable). Recognised for D.A. and F.F.A. R.C.S. Resident, or non-resident if local.

Apply as soon as possible, naming 3 referees, to Hospital Secretary.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. (15 miles from Edinburgh.) HOUSE SURGEON (pre-registration post) required 1st February, 1960, for General Surgical Unit. Salary and conditions of service in accordance with regulations.

Applications to Group Secretary, Board of Management, Bangour General Hospital, Broxburn, West Lothian.

BURNLEY AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics). The post offers ample opportunity for instruction and practical experience under Group Consultants and is recognised for the F.F.A. R.C.S. and D.A. Resident accommodation is available.

Applications, with 2 references, to Group Secretary, Burnley General Hospital.

BURNLEY GENERAL AND VICTORIA HOSPITALS, BURNLEY. MANCHESTER REGIONAL HOSPITAL BOARD. REGISTRAR to the Department of Psychological Medicine. This post offers an opportunity for wide experience in the treatment of inpatients (including psychiatric patients in general medical wards), outpatients, and day patients, in addition to patients in Social Therapy Club. The person appointed will be part of a team consisting of Consultant Psychiatrist, part-time Senior Hospital Medical Officer, Registrar, and Senior House Officer. The post is recognised for the D.P.M. Facilities available for attending D.P.M. course at Manchester and studying for higher qualifications. Accommodation is available for a single or married applicant. The services of a social worker, occupational therapist, and mental-health workers are available.

Applications, with names of 2 referees, to Group Secretary, Burnley General Hospital.

BURNLEY GENERAL HOSPITAL. (646 Beds.) Resident HOUSE OFFICER (medical). The appointment is approved as a pre-registration post.

Applications, with 2 references, to Group Secretary, Burnley General Hospital.

BURTON-ON-TRENT GENERAL HOSPITAL. Casualty OFFICER (Junior Hospital Medical Officer grade) required immediately. Rotating duties with outpatient clinics, wards and operating sessions. Whitley Council scale and conditions of service. Married accommodation available.

Applications to Group Secretary as soon as possible.

CARDIFF. ROYAL HAMADRYAD GENERAL AND SEAMEN'S HOSPITAL. Applications invited for the post of RESIDENT SENIOR HOUSE OFFICER (urology) at above Hospital. Hospital has 40 urological and 22 surgical beds and is staffed by members of the Consultant Urological and Surgical Staff of United Cardiff Hospitals (Teaching Group). Majority of male urological cases from area are treated in this Hospital. Appointment is joint one with Urological Department of United Cardiff Hospitals, thus enabling experience in female and pædiatric urology to be obtained.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARDIFF. WHITCHURCH HOSPITAL. (800 Beds.) Applications are invited from practitioners who have held general house appointments for the post of SENIOR HOUSE OFFICER in Psychiatry (Male or Female). Opportunities exist for gaining experience in all branches of psychiatry. Salary according to Whitley scale, less £150 p.a. if resident.

Forms of application to be obtained from the Physician-Superintendent, to whom they should be returned, together with the names of 2 referees, within 14 days of the appearance of this advertisement.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. SENIOR HOUSE OFFICER in Anæsthetics (resident) for 6 months or a year from 15th February, 1960. Recognised for D.A. and F.F.A. R.C.S.

Apply to the Secretary, Addenbrooke's Hospital, Cambridge, stating age, nationality, qualifications and experience with dates, and enclosing copies of 3 testimonials, by 9th January.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. HOUSE SURGEONS (2) for 6 months from 16th February, 1960. Recognised pre-registration service.

Apply to the Secretary by 9th January, stating age, nationality, qualifications and experience with dates, and with copies of 3 testimonials.

CAMBRIDGE. UNITED CAMBRIDGE HOSPITALS, ADDENBROOKE'S HOSPITAL. SENIOR REGISTRAR in Anæsthetics (non-resident) required for 1 year in the first instance from March, 1960, renewable annually to a maximum of 4 years. Candidates should possess a higher qualification in anæsthetics.

Apply, with full particulars, and names of 3 referees, to the Secretary, by 9th January, 1960.

CANTERBURY AND ISLE OF THANET HOSPITAL MANAGEMENT COMMITTEES. Locum ORTHOPÆDIC REGISTRAR required for duties in the above areas for period 1st February–3rd May, 1960. Possession of a car an advantage. Married accommodation available at nominal rental.

Applications, with full details, and the names of 3 referees, to be sent to the Group Secretary, Canterbury Group Hospital Management Committee, Central Office, Nunnery Fields Hospital, Canterbury.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER at the above Mental Hospital. Salary £852 6s. p.a. House available on Hospital estate for which rent and rates are charged. Facilities for a course of study for Part I of the D.P.M. Appointment subject to the National Health Service (superannuation) regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience, and names of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CARLUKE, LANARKSHIRE. LAW HOSPITAL. (790 Beds.) Applications are invited for the following (pre- or post-registration) posts for the 6 months commencing 1st February, 1960:—

(*a*) HOUSE PHYSICIAN.
(*b*) HOUSE SURGEON.
(*c*) ORTHOPÆDIC HOUSE OFFICER.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be sent to the Group Medical Superintendent, Law Hospital, Carluke.

CARSHALTON. ST. HELIER GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) to the Geriatric Unit of the St. Helier Group. Duties to consist of work at the Downs Hospital, for long-term rehabilitation and longer-stay cases, and in the Geriatric Unit of St. Helier Hospital.

Applications, stating age, qualifications and experience, with copies of testimonials, and the names of 2 referees, should be sent to the Secretary, Downs Hospital, Cotswold-road, Sutton, Surrey.

CHEAM, SURREY. ST. ANTHONY'S HOSPITAL. Experienced ASSISTANT to the E.N.T. Consultant required for 1 or 2 sessions weekly, to assist in outpatient and surgical sessions. Immediate vacancy.

Applications, stating age, qualifications and experience, with copies of 2 testimonials, to be addressed to the Hospital Secretary.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON (pre-registration) at the Chelmsford and Essex Hospital becoming vacant on 5th January. The post offers good surgical experience and is recognised for the F.R.C.S.

Applications, with copies of 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD HOSPITAL MANAGEMENT COM-MITTEE. Locum SENIOR HOUSE OFFICER ANÆSTHETIST (resident) required for period 3rd–17th January.

Apply Group Secretary, London-road, Chelmsford, Essex.

CHELTENHAM. ST. PAUL'S HOSPITAL. Senior House OFFICER required for Gynæcological and Surgical Ward (54 Beds).

Applications, stating age, experience, and names of 2 referees, to the Group Secretary, Cheltenham Group Hospital Management Committee, General Hospital, Cheltenham.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Rotating Internship. A vacancy occurs for a HOUSE PHYSICIAN (pre- or post-registration) at the Cheltenham General Hospital. The post is vacant in January, 1960, and the successful candidate on completion of this 6-month appointment will be offered (subject to satisfactory services) the position of House Surgeon followed by that of Resident Obstetric Officer at the Cheltenham Maternity Hospital, if desired.

Applications, stating age and experience, and names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Rotating Internship. A vacancy occurs for a HOUSE SURGEON (pre- or post-registration) at the Cheltenham General Hospital. The post is vacant in January, 1960, and the successful candidate on completion of this 6-month appointment will be offered (subject to satisfactory services) the position of House Physician followed by that of Resident Obstetric Officer at the Cheltenham Maternity Hospital, if desired.

Applications, stating age and experience, and names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. (Late Botleys Park War Hospital.) RESIDENT HOUSE SURGEON (Senior House Officer or Intern) required for Gynæcological (30 Beds) and E.N.T. (approximately 14 Beds) Departments. Salary in accordance with terms and conditions of National Health Service. Post vacant January, 1960.

Applications, together with names and addresses of referees, to Physician-Superintendent, St. Peter's Hospital, Chertsey.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital) and WOKING VICTORIA HOSPITAL. CASUALTY OFFICER (Senior House Officer grade). Recognised for F.R.C.S. The post gives time and opportunity for reading and for attending consultative outpatients. The 2 hospitals are 4½ miles apart, and each of 2 Casualty Officers spends half his time at St. Peter's, which collects the major casualties of the area, and the remainder at Woking, which attracts large numbers of all other casualties. Resident or non-resident.

Applications, with names and addresses of referees, to Physician-Superintendent, St. Peter's Hospital, Chertsey.

CHESTERFIELD ROYAL HOSPITAL. (281 Beds.) Applications are invited for the following appointments at above Hospital which will be vacant early in January next:—

2 HOUSE PHYSICIANS. Posts approved for pre-registration service.

2 HOUSE SURGEONS. Posts recognised for F.R.C.S. and pre-registration purposes.

Applications, with names of 2 referees, to be addressed to the Group Secretary, Chesterfield Hospital Management Committee, from whom further information is obtainable.

CHESTER-LE-STREET. GENERAL HOSPITAL. (194 Beds.)

SENIOR HOUSE OFFICER (general surgery). Post recognised under F.R.C.S. regulations. Vacant 1st February, 1960.

HOUSE PHYSICIANS (general medicine). 2 approved pre-registration appointments. Posts vacant 1st February, 1960.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

CHICHESTER, SUSSEX. ST. RICHARD'S HOSPITAL. Applications are invited for the post of MEDICAL REGISTRAR. Resident or non-resident, mainly at St. Richard's Hospital (400 Beds). Post vacant mid-February. Registrar will have care of 100 acute medical and pædiatric beds under the supervision of the Consultant Physicians and Pædiatrician and will also assist the Consultant Neurologist, Chest Physician, and Thoracic Surgeon. Salary according to terms and conditions of service of hospital medical staff. Candidates may visit the Hospital.

Forms from Group Secretary, Chichester Group Hospital Management Committee, 174, Broyle-road, Chichester.

CHICHESTER, SUSSEX. ST. RICHARD'S HOSPITAL. CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE PHYSICIAN at St. Richard's Hospital (400 Beds). Duties include care of general medical and pædiatric beds and special duties on the Medical and Surgical Thoracic Unit. Post vacant mid-January.

Applications, stating age, qualifications and experience, and giving names of 2 persons to whom reference may be made, should be sent to the Administrative Officer.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for:—

Essex County Hospital, Colchester, Essex (178 Beds)

Post of HOUSE SURGEON. Pre-registration or third post. Tenable for 6 months. Recognised for F.R.C.S.

Post of SENIOR HOUSE OFFICER (anæsthetics). Post tenable for 1 year. Recognised for F.F.A.R.C.S. and D.A. The successful candidate will be called upon to give anæsthetics in other hospitals in the Group. Vacant from 20th January.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COVENTRY AND WARWICKSHIRE HOSPITAL. (404 Beds.) HOUSE SURGEON (general surgery). Pre-registration. Vacant 6th February. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary, Coventry and Warwickshire Hospital, Coventry.

COVENTRY. GULSON HOSPITAL. (312 Beds). House PHYSICIAN. Vacant 24th January. Pre-registration. Resident.

Applications to Hospital Secretary

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER (general surgery). Vacant 1st January. Also LOCUM required 31st January–18th February. Recognised F.R.C.S. if held by Senior House Officer.

Apply, giving full details and 2 names for reference, to Secretary.

DEVONPORT. SOUTH DEVON AND EAST CORN-WALL HOSPITAL. (Surgical hospital—74 Beds.) RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade) with emergency work and routine surgery under supervision and with outpatient duties. Post vacant immediately.

Apply, stating age, nationality, qualifications and experience, and giving the names and addresses of 3 referees, to the Group Secretary, 7, Nelson-gardens, Stoke, Plymouth.

DORKING GENERAL HOSPITAL, Horsham-road, Dork-ING, SURREY. Applications invited for post of SENIOR HOUSE OFFICER (orthopædic), with casualty and relief general surgical duties. Vacant 1st January, 1960. Recognised for F.R.C.S.

Apply Medical Superintendent.

DARLINGTON MEMORIAL HOSPITAL. Applications are invited from Male or Female practitioners for the appointment of RESIDENT ANÆSTHETIST (Senior House Officer), now vacant. The Hospital is recognised for study for the D.A. and F.F.A. R.C.S. Salary £852 6s. p.a. Residence available.

Apply in writing, with references and full details, to the undersigned forthwith.

G. W. BECKWITH, Group Secretary,
Darlington District Hospital Management Committee.

DONCASTER. WESTERN HOSPITAL. Applications are invited from registered medical practitioners for the appointment of RESIDENT MEDICAL OFFICER in the grade of Junior Hospital Medical Officer.

Applications, stating age, qualifications and experience, together with copies of 3 recent testimonials, should be forwarded to the Group Secretary, Doncaster Hospital Management Committee, Doncaster Royal Infirmary.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) SENIOR HOUSE SURGEON required at this busy general hospital. Suitable post for candidate seeking further clinical experience and reading for higher qualifications. Recognised for F.R.C.S. 4 House Officer posts. National Health Service salary and conditions. Post becomes vacant 1st January, 1960.

Apply, giving the usual particulars, and names of 2 referees, to the Secretary, Noble's Isle of Man Hospital, Douglas.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

Burton Road Hospital, Dudley

SENIOR HOUSE OFFICER (general medicine and geriatrics). Resident. Post vacant January, 1960. Adequate off-duty time for studying.

Applications, naming 2 referees, to Group Secretary, Guest Hospital, Dudley, Worcs.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (surgical). Post vacant end January, 1960.

Wordsley Hospital, near Stourbridge (478 Beds)

HOUSE OFFICER (medical), pre-registration. Post vacant January, 1960.

Apply Group Secretary, The Guest Hospital, Dudley, Worcs.

DURHAM. DRYBURN HOSPITAL. (307 Beds.)

HOUSE SURGEON (general surgery). Approved pre-registration appointment and recognised for the F.R.C.S. Post vacant 1st February, 1960.

HOUSE PHYSICIANS (general medicine). 2 approved pre-registration appointments. Posts vacant 1st February, 1960.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Geriatrics, Ipswich and East Suffolk Hospital Group. New Area Service in course of development under Consultant Physician in Geriatrics. Duties at Unit in Ipswich and East Suffolk Hospital and other hospitals in area. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 11th January, 1960. Candidates invited to visit by direct arrangements with Hospital Management Committee Secretary, Broughton House, Broughton-road, Ipswich.

EAST GRINSTEAD, SUSSEX. QUEEN VICTORIA HOSPITAL. (PLASTIC SURGERY AND JAW INJURY CENTRE.) (260 staffed beds.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for resident appointment of SENIOR HOUSE OFFICER in Anæsthetics. Vacant 13th February, 1960. Duties in anæsthesia for both general and plastic surgery. Post recognised for examination of D.A. and F.F.A. R.C.S.

Applications, stating qualifications, experience, age, and names of 3 referees, to Group Secretary as soon as possible.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (647 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR, whole-time, non-resident, required at above Hospital. Higher surgical qualifications desirable. Hospital may be visited by direct appointment with the Medical Administrator.

Appointment forms obtainable from and returnable to Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, by 2nd January, 1960.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from pre-registration and registered medical practitioners for the appointment of HOUSE SURGEON in General Surgery vacant now.

Applications, with copies of 2 recent testimonials or the names of 2 referees, to the Hospital Secretary immediately.

GLASGOW. WESTERN DISTRICT HOSPITAL, 63, Possil-road, GLASGOW, C.4. HOUSE OFFICERS are required for the Medical and Surgical Units of above Hospital for the period beginning 1st February, 1960.

Applications to the Medical Superintendent.

GRIMSBY GENERAL HOSPITAL. Senior House Officer (casualty) required. Post vacant shortly. Establishment consists of Senior Casualty Officer and 2 Senior House Officers. Excellent medical library taking principal periodicals.

Applications, with names of 2 referees, to Hospital Secretary.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (146 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON for General Surgical and Urological Surgery and Ophthalmology. The Hospital is the main surgical unit in the Group, with a resident staff of 4. The post is recognised for the F.R.C.S., for which it offers excellent experience. The appointment is for 6 months and falls vacant on 1st February, 1960.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, or the names of 2 referees, should be submitted to the Hospital Administrator.

HASTINGS HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT MEDICAL OFFICER required for whole-time duties at hospitals in the Hastings Group (non-resident), 4th–10th January, 1960, inclusive. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff.

Applications, giving age, qualifications and experience, together with copies of 3 recent testimonials or the names and addresses of 2 referees, to be sent to the Secretary, Hospital Management Committee, 11, Holmesdale-gardens, Hastings, immediately.

HASTINGS. ST. HELEN'S HOSPITAL. (491 Beds.) Applications are invited for the post of Pre-registration HOUSE PHYSICIAN at this Hospital, which is the main medical centre of the Group, with a resident staff of 5, and offers a wide experience in general medicine. The appointment is for 6 months and falls vacant on 3rd January, 1960.

Applications, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, or the names of 2 referees, should be submitted to the Hospital Administrator.

HASTINGS, SUSSEX. ST. HELEN'S HOSPITAL. Locum HOUSE PHYSICIAN required at St. Helen's Hospital which is the main medical centre of the Group.

Apply to the Administrator.

HALIFAX. ROYAL HALIFAX INFIRMARY. Senior HOUSE OFFICER in Anæsthetics required. Post recognised for F.F.A. R.C.S. and D.A.

Applications to be forwarded to the Secretary, Royal Halifax Infirmary, Halifax.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. 2 HOUSE SURGEONS (pre-registration) required. Posts vacant latter end of December.

Applications, giving full details, and 2 names for reference, should be sent to the Hospital Secretary as soon as possible.

HENLEY-ON-THAMES, OXFORDSHIRE. PEPPARD CHEST HOSPITAL. (236 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital deals with all types of chest disease in medical and surgical wards. Previous experience in resident hospital appointments is desirable. Single accommodation is available.

Applications, stating age, qualifications and experience, with names of 2 referees, should be forwarded to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

HEREFORD GENERAL HOSPITAL. (154 Beds.) 2 House SURGEONS required, pre-registration posts. Posts vacant 19th and 31st January, 1960. Hospital recognised by R.C.S. Duties include care of general surgical beds and in addition for 3 months of orthopædic beds and 3 months of E.N.T. beds.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary, Victoria House, Eign-street, Hereford.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. CASUALTY OFFICER required for duty with Accident Service and as Orthopædic House Surgeon. Grading, up to Senior House Officer, depending on experience, and recognised as pre-registration post and F.R.C.S. accordingly.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to the Medical Administrator, Lister Hospital, as soon as possible.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Resident ANÆSTHETIST (Senior House Officer) required 1st February, 1960. Post recognised for D.A. and F.F.A. R.C.S. examinations.

Applications, with names of 2 referees, to the Medical Administrator, Lister Hospital, Hitchin.

HOVE GENERAL HOSPITAL, Sackville-road, Hove, 3, SUSSEX. Locum SENIOR HOUSE OFFICER required on 4th January for 3½ weeks. Salary £16 12s. per week.

Applications to Administrative Officer.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE PHYSICIAN, to commence duties immediately. The post is recognised as a pre-registration appointment. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON,
Group Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (412 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the immediate vacancy of RESIDENT HOUSE SURGEON (pre-registration post).

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. 2 HOUSE SURGEONS required, 1 immediately and 1 on 1st February, 1960. Interesting and varied posts which include outpatient clinics, and which are recognised for D.C.H. Both are for a term of 6 months, and are expected to be upgraded to Senior House Officer in the near future.

Applications, together with details of experience, testimonials &c., to be sent to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Applications invited for the post of HOUSE OFFICER for Plastic Surgery and Orthopædic Units. Post vacant now.

Applications, with copies of up to 3 testimonials, to the Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 4th January, 1960.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior HOUSE OFFICER (anæsthetics). Post recognised by the Faculty of Anæsthetists. Vacant 26th January, 1960.

Applications, stating age, qualifications, experience and copies of up to 2 testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 5th January, 1960.

ILKLEY. MIDDLETON HOSPITAL. (346 Beds.) Resident SENIOR HOUSE OFFICER (surgery) required for above Hospital. Ample facilities for study.

Applications, stating age, nationality, qualifications and experience, to the Secretary.

ILKLEY. MIDDLETON HOSPITAL. (346 Beds.) Junior HOSPITAL MEDICAL OFFICER required for general duties at above Hospital which caters for geriatrics, orthopædics, non-tubercular chest diseases, gynæcology, and general surgery. Appointment is subject to terms and conditions of service of hospital medical staff and is limited to 3 years in the first instance. Residential accommodation for single applicants only. Ample facilities for study.

Applications, together with names of 2 referees, as soon as possible to the Group Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH. (280 Beds.) Applications invited for post of HOUSE PHYSICIAN (pre-registration) now vacant.

Applications, giving details of qualifications, age, nationality, &c., with copies of 3 recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH. (280 Beds.) Applications invited for post of SENIOR HOUSE OFFICER to Fracture and Orthopædic Department. Post vacant mid-January, recognised for R.C.S. examinations.

Applicatons, with full details, and copies of recent testimonials, to the Hospital Secretary.

IPSWICH. FOXHALL HOSPITAL. (Actively engaged in the investigation and treatment of all forms of chest disease, including Respiratory Physiology Department and major surgery.) SENIOR HOUSE OFFICER required for duties mainly on non-tuberculous and surgical wards. Suitable for one studying for higher examinations. Good medical library facilities. A married doctor occupying the post could live out.

Further particulars may be had from Dr. G. R. MCNAB, Physician-Superintendent, to whom applications should be made.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. Applications are invited from suitably qualified Medical Officers for the post of SENIOR HOUSE OFFICER (E.N.T.) which is available on 1st January, 1960. The post is recognised for F.R.C.S. purposes.

Applications, stating age, qualifications and experience, together with names of 2 referees, should reach the Physician-Superintendent of the Hospital as soon as possible.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

(*a*) Duties at hospitals in the Bradford A and B Groups (present establishment 1 Senior Registrar and 3 Registrars). Approximately 660 Beds in the surgical specialties. Resident or non-resident. Recognised for the F.F.A. R.C.S.

(*b*) Duties at hospitals in the Halifax Group. Approximately 380 Beds in the surgical specialties. Married accommodation may be available. Recognised for the F.F.A. R.C.S. and the D.A.

Obstetrics and Gynæcology

Huddersfield Group (17 gynæcological and 103 obstetric beds). Recognised for M.R.C.O.G. Resident.

Psychiatry

The Board, in association with the Department of Psychiatry of the University of Leeds, wishes to encourage applications for the undermentioned posts from doctors suitable for training in psychiatry who wish to take the D.P.M. course, full particulars of which can be obtained from the Sub-Dean, The Medical School, Thoresby-place, Leeds, 2.

(*a*) Meanwood Park Hospital (Mental Deficiency), Leeds (800 Beds). Accommodation for married person with no children, and single accommodation also available.

(*b*) Stanley Royd Hospital, Wakefield (approximately 2000 Beds). Married and single accommodation available.

(*c*) Storthes Hall Hospital, Huddersfield (2750 Beds). 2 vacancies. Resident. Married and single accommodation available.

Candidates may visit the hospitals by direct arrangement with the Physician-Superintendents thereof, who will be pleased to supply further information.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 6th January, 1960.

LEEDS. THE UNITED LEEDS HOSPITALS. THE GENERAL INFIRMARY AT LEEDS. RESIDENT MEDICAL OFFICER required at the Ida and Robert Arthington Hospital, Cookridge, Leeds. The Hospital is used as a pre-convalescent annexe to the Teaching Hospital. The post involves some regular duties at the General Infirmary at Leeds. Residential accommodation available for single person; house available for married officer at reasonable rental. Appointment tenable for 1 year. Post vacant 1st January, 1960. The post is of Senior House Officer status.

Applications, giving age, qualifications, posts held, with dates, and 3 names for reference, should be sent to the Secretary to the Board by not later than 31st December, 1959.

LANCASTER. ROYAL LANCASTER INFIRMARY. RESIDENT HOUSE PHYSICIAN (House Officer grade). The post is recognised for pre-registration service and tenable for 6 months.

Applications, stating age, qualifications and experience, and with 2 names for reference, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. HOUSE OFFICER (pre-registration), Surgery. The successful applicant will work with Consultant Unit and will attend consultative clinics. Post tenable for 6 months.

Applications, stating age, qualifications and experience, and with 2 names for reference, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LANCASTER. ROYAL LANCASTER INFIRMARY. (230 Beds.) SENIOR HOUSE OFFICER (surgical). The successful applicant will work with a Consultant Surgical Unit and attend at Consultative Clinics. The post is recognised for F.R.C.S.

Applications, with names of 2 referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LINCOLN COUNTY HOSPITAL, Lincoln. (200 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in Casualty and Orthopædics.

Full details and the names of 3 referees should be sent to the Secretary.

LOUTH, LINCOLNSHIRE. COUNTY HOSPITAL. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER (obstetrics and gynæcology) which becomes vacant 1st January, 1960, at this busy General Hospital.

Applications, giving age, qualifications and experience, together with the names of 2 referees, should be addressed to the Hospital Secretary.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6-month appointment. Post available February, 1960. Recognised for F.R.C.S.

Applications, stating age and experience, to the Administrative Officer.

MANCHESTER. BAGULEY HOSPITAL. (402 Beds.) SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Chest Diseases. This Hospital is a large thoracic unit fully equipped for the medical and surgical treatment of tuberculosis and other chest diseases. Attached to the Hospital is a chest clinic. The post offers opportunities for wide experience in medical and surgical treatment of patients suffering from tuberculosis and other diseases of the chest, together with chest clinic work. Ample scope for clinical research.

Applications, stating age, qualifications, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, by 2nd January, 1960.

MANCHESTER. BOOTH HALL CHILDREN'S HOSPITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.) Locum SENIOR HOUSE OFFICER (surgical). Duties mainly general surgery and neurosurgery. (5 surgical residents share casualty duties.)

Applications immediately, giving names and addresses of 2 referees, to Group Secretary, from whom further particulars may be obtained.

MANCHESTER, 20. CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER in Radiotherapy at the above Hospital. Suitable applicants may be eligible to join a D.M.R.T. course during the term of the appointment.

Apply immediately, with full details, and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER (near). DAVID LEWIS COLONY. Applications are invited for a Medical Officer in the grade of REGISTRAR. Remuneration and conditions of service in accordance with the national scale. Accommodation is available for a single person. Facilities for study or research will be granted. The post is normally held for 2 years and provides experience in the treatment and general care of persons who suffer from epilepsy. 435 Beds for men, women and children.

Further particulars can be obtained from the Medical Director, The David Lewis Colony, Warford, Alderley Edge, near Manchester.

MANCHESTER. PARK HOSPITAL, Davyhulme. MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for the post of REGISTRAR in Orthopædics at above Hospital, with facilities to maintain liaison with the Centre for Hip Surgery at Wrightington Hospital, Wigan, for which a car would be essential. This appointment offers excellent opportunity for candidates with previous orthopædic experience. Residential facilities are available at Park Hospital if required.

Applications to Group Secretary, Park Hospital, Davyhulme, not later than 13th February, 1960.

MANCHESTER. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics with duties in the South Manchester Group. This post is recognised by the Royal College of Surgeons for the F.F.A. R.C.S. and for the D.A.

Applications, stating age, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, not later than 9th January, 1960.

MANCHESTER, 20. WITHINGTON HOSPITAL, South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER to the Geriatric Department which will become vacant in early February, 1960 (resident or non-resident). Duties are primarily in the active medical wards. Excellent experience is available in the unit which has been developed on modern lines and has available full general hospital facilities.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary not later than 9th January, 1960.

MANCHESTER. WYTHENSHAWE HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at above Hospital. The post will include the responsibility for general surgical beds and is recognised by the Royal College of Surgeons.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20, not later than 2nd January, 1960.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Anæsthetics with the Stockport and Buxton Hospital Management Committee, vacant 26th January, 1960. The post, which may be resident or non-resident, is recognised for the D.A. and F.F.A. R.C.S. and would suit a candidate wishing to study for higher qualification.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Anæsthetics to the West Manchester Hospital Management Committee with duties primarily at Park Hospital, Davyhulme, but with duties at other hospitals within the Group as required. Post vacant mid-January.

Applications, giving full details, together with names of referees, to the Group Secretary, Park Hospital, Davyhulme, Manchester.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of ANÆSTHETIC REGISTRAR with duties in the South Manchester Group. The post is recognised by the Royal College of Surgeons for the F.F.A. R.C.S. and for the D.A.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, not later than 9th January, 1960.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for 12 months from 1st February, 1960. Previous hospital experience in general medicine and surgery and in obstetrics necessary. Recognised for M.R.C.O.G. examination. Duties involve clinical responsibility for mothers and babies and supervision of work of pre-registration House Officers. National scale.

Application forms from the undersigned, to be returned by 30th December, 1959. A. R. J. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The post is recognised for the purpose of the M.R.C.O.G. examination. The appointment is for 6 months, starting 1st February, 1960. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 30th December, 1959.

A. R. J. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MEDICAL RESEARCH COUNCIL. Pneumoconiosis RESEARCH UNIT. Applications are invited for post of REGISTRAR (non-resident). Duties include supervision of patients admitted to ward and outpatient work. Opportunity and time available to assist in clinical trials and pulmonary physiological research. Much may also be learnt about the epidemiological method approach to the study of common diseases.

Apply in writing to Director of the above Unit at Llandough Hospital, Penarth, Glamorganshire.

MIDDLESBROUGH GENERAL HOSPITAL, Ayresome Green-lane, MIDDLESBROUGH. SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER for duties in the recently opened Neurosurgical Unit of the above Hospital. The Unit is fully equipped for all modern methods of diagnosis and treatment. The post is suitable either for those interested in the medical aspects of neurology or for those who wish for surgical experience.

Applications, stating age, qualifications and experience, together with the names of 3 referees, to be sent to the Hospital Secretary.

MIDDLESBROUGH. HEMLINGTON HOSPITAL. (196 Beds.) SOUTH TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medicine) to the Geriatric Admission Unit for Tees-side (22 Male and 22 Female beds with full ancillary services). These wards have a high turnover and are under the charge of a Consultant Physician.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, to be sent to the Hospital Secretary.

MID GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following medical posts which will fall vacant on 1st February, 1960 :—

Neath General Hospital, Neath (412 Beds)
HOUSE SURGEONS.
HOUSE PHYSICIANS.
HOUSE SURGEONS (obstetrics and gynæcology).

Bridgend General Hospital, Quarella-road, Bridgend (381 Beds)
HOUSE SURGEONS.
HOUSE PHYSICIANS.
HOUSE SURGEONS (obstetrics and gynæcology).

These Hospitals are recognised for the major diplomas and approved by the General Medical Council for pre-registration service.

Applications, giving the names and addresses of 2 referees, to be addressed to the Group Secretary of the Committee, 8, Windstreet, Neath.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar OBSTETRICIAN, whole-time, resident, for South Tees-side Group of hospitals—main hospital Middlesbrough Maternity (80 Beds), and Middlesbrough General (515 Beds). Post affords excellent obstetrical and gynæcological experience. Single or married accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar OBSTETRICIAN AND GYNÆCOLOGIST, whole-time for Durham Group of hospitals—Dryburn (310 Beds—24 gynæcological, 44 obstetric). Post recognised for M.R.C.O.G. and D.Obst.R.C.O.G. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar ORTHOPÆDIC SURGEON, whole-time for Gateshead Group of hospitals—main hospitals Queen Elizabeth (176 Beds), Dunston Hill (296 Beds), Bensham General (230 Beds), 135 orthopædic beds. Facilities available for experience of elective and traumatic orthopædic work.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE GENERAL HOSPITAL. Senior House OFFICER required in Regional Department of Urological Surgery. Post offers excellent opportunities for obtaining practical experience and is recognised for the F.R.C.S. (Eng.).

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE UPON TYNE GROUP OF HOSPITALS. (Formerly the Newcastle upon Tyne Eye Hospital.) SENIOR HOUSE OFFICER required for the Eye Department.

Applications, stating qualifications and experience, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NELSON. REEDYFORD MEMORIAL HOSPITAL. (95 Beds.) RESIDENT HOUSE OFFICER (surgical). Modern self-contained flat available which provides excellent accommodation for a single or married applicant.

Applications, with 2 references, to Group Secretary, Burnley and District Hospital Management Committee, Burnley General Hospital.

NEWBURY DISTRICT HOSPITAL, Newbury, Berkshire. Locum RESIDENT SURGICAL OFFICER (Senior House Officer grade) required 23rd January–7th February, 1960.

Apply Secretary.

NORTH EAST METROPOLITAN HOSPITAL REGION. BLOOD TRANSFUSION SERVICE. MEDICAL OFFICER required to take charge of mobile team operating in the above Region. Opportunities also to study serology in modern laboratories.

Applications to the Director, Regional Blood Transfusion Centre, Crescent-drive, Brentwood, Essex (telephone 3545), within 14 days of appearance of this advertisement, stating age, experience and qualifications, and quoting 2 names and addresses for reference.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PÆDIATRIC REGISTRAR required for duties at Shrodells Hospital, Watford, and West Herts Hospital, Hemel Hempstead. Post vacant immediately. Hospitals may be visited by direct appointment.

Application form obtainable from and returnable to Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 2nd January.

NUNEATON. GEORGE ELIOT HOSPITAL. (275 Beds.) HOUSE PHYSICIAN. Pre-registration. Resident. 49 medical beds.

Applications to Hospital Secretary.

NUNEATON. GEORGE ELIOT HOSPITAL. (275 Beds.) HOUSE SURGEON in General Surgery. Vacant 2nd February. Pre-registration. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

NUNEATON. MANOR HOSPITAL. (125 Beds.) House OFFICER in General Surgery. Vacant 29th February, 1960. Pre-registration. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

NUNEATON. MANOR HOSPITAL. (125 Beds.) House SURGEON (traumatic and orthopædic surgery). Vacant 26th January. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

NOTTINGHAM EYE HOSPITAL. Senior House Officer (ophthalmology) required. Duties to commence 11th January, 1960. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in the Pathology Department at the above Hospital. Duties to commence on 1st February, 1960. Previous experience in pathology not essential. Opportunities for training in all branches of clinical pathology are afforded in a department serving over 1200 Beds.

Applications, stating age, qualifications, experience, nationality, and names and addresses of 3 referees, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T.). This post is recognised for the D.L.O. and F.R.C.S. examinations. Duties to commence on 23rd January, 1960.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE SURGEONS required. Posts vacant mid-January, 1960, and early February, 1960.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident Pre-registration HOUSE PHYSICIANS required. Posts vacant mid-January, 1960, and early February, 1960.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Pathology (whole-time) in the Swindon Area Laboratory, serving a total of 1000 Beds. Post offers wide experience in all branches. The Laboratory in the new Princess Margaret Hospital, Swindon, will be opened shortly. Appointment for 1 year in first instance and eligible for extension to a second year on receipt of a satisfactory report.

Application forms, obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 2nd January, 1960.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in General Medicine, Stoke Mandeville Hospital, Aylesbury. Opportunities are given for using the postgraduate facilities at the Teaching Centre at Oxford. Higher qualification desirable.

Applications, on forms obtainable from the Secretary, 43, Banbury-road, should reach him by 4th January, 1960.

OXFORD REGIONAL HOSPITAL BOARD. Registrar (whole-time) in Anæsthetics to the Northampton Group of Hospitals. The post provides good experience in all branches of anæsthetics. Single accommodation is available.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 11th January, 1960.

OXFORD REGIONAL HOSPITAL BOARD. Registrar, whole-time, in Anæsthetics to the High Wycombe/Amersham area. Recognised for the F.F.A. R.C.S. Available mid-February. Married accommodation available.

Applications on forms obtainable from the Secretary, Committee for Registrars, 43, Banbury-road, Oxford, to be returned to him by 11th January, 1960.

OXFORD. THE UNITED OXFORD HOSPITALS. Applications invited for the post of SENIOR REGISTRAR in Dermatology. This is a newly established post. Applicants must be Members of one of the Royal Colleges of Physicians and, provided they have had an adequate training in general medicine, need not necessarily have had much previous experience of dermatology.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received not later than 9th January, 1960.

PAISLEY. INFECTIOUS DISEASES HOSPITAL. Applications are invited for the post JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER at above Hospital for a 6- or 12-month period from 1st February, 1960. The post offers a wide experience in infectious diseases, and there are also a thoracic surgical unit and a tuberculosis unit in the Hospital. Opportunities are available for postgraduate study and research.

Applications, with names of 2 referees, should be submitted to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PETERBOROUGH. MEMORIAL HOSPITAL. Peterborough and Stamford Hospital Management Committee. Applications are invited for the position of HOUSE PHYSICIAN, vacant on 1st January, 1960. The appointment will be for 6 months.

Applications, with testimonials, should be addressed to the Secretary, Memorial Hospital, Peterborough.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL, FREEDOM FIELDS. Central Casualty Department. RESIDENT SENIOR HOUSE OFFICER in Casualty, vacant 1st January, 1960. Recognised for the F.R.C.S.

Apply, with names of 3 referees, also stating age, nationality, qualifications and experience, to the Group Secretary, 7, Nelson-gardens, Plymouth.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL HOSPITAL. Following HOUSE SURGEON posts:—

Devonport Section. 1 vacant post 1st March, 1960.
Freedom Fields Section. 1 vacant post 12th December, 1959.
Greenbank Road Section. 3 vacancies 1st December, 1959, 1st and 14th January, 1960.

Apply, with names of 3 referees, also stating age, nationality, qualifications and experience, to the Group Secretary, 7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. Department of Obstetrics and Gynæcology. Applications are invited for the post of RESIDENT HOUSE OFFICER in Obstetrics and Gynæcology, vacant 1st April, 1960, for a period of 9 months. The post offers wide experience and is recognised for the D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to the Group Secretary, 7, Nelson-gardens, Devonport.

PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE. ANÆSTHETIST (Junior Hospital Medical Officer grade) required.

Applications, personally or in writing, as soon as possible to the Group Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE. RESIDENT CASUALTY OFFICER required. Graded Senior House Officer. Recognised for Fellowship. Married accommodation available.

Applications personally or in writing as soon as possible to the Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

PONTEFRACT AND CASTLEFORD HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Senior House Officer grade) required. 208 Beds including Geriatric Admission Unit.

Applications, personally or in writing, as soon as possible to the Group Secretary, Great Northern House, Salter-row, Pontefract, Yorkshire.

PONTEFRACT GENERAL INFIRMARY. House Surgeon required. This is a pre-registration post but applications will be considered from fully registered practitioners. Married accommodation available.

Applications, personally or in writing, as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

PONTYPRIDD (near). EAST GLAMORGAN HOSPITAL, CHURCH VILLAGE, near PONTYPRIDD. (336 Beds and large Outpatient Department serving population of 174,000. Recognised for M.R.C.O.G., D.Obst.R.C.O.G., F.R.C.S., D.C.H., F.F.A. R.C.S., D.A.) Applications are invited for the following posts which will become vacant on 1st February, 1960:—

1. SENIOR HOUSE OFFICER (surgery).
2. SENIOR HOUSE OFFICER (pathology). Previous experience in pathology not essential. Emergency duties are shared with other residents.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent, as soon as possible, to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bournemouth AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR SURGICAL REGISTRAR required at above Hospital, 1st–29th February, 1960, inclusive.

Applications, with 2 testimonials, to Hospital Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital (254 Beds)

Orthopædics (104 orthopædic beds)

SENIOR HOUSE SURGEON required for the Orthopædic Department. Vacant 1st January, 1960. The post offers wide experience in both traumatic and orthopædic work and is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible. L. C. ROGERS, Group Secretary.

Saint Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. The following pre-registration posts become available during January and February, 1960. The Group has 4 Consultant Physicians and 6 Consultant Surgeons. Opportunities are available for House Officers to interest themselves in the specialist departments, e.g., Cobalt Radiotherapy Unit.

Saint Mary's Hospital (691 Beds)

72 medical beds.
HOUSE PHYSICIAN (2 posts).
53 paediatric beds.
HOUSE PHYSICIAN (1 post).
120 surgical beds.
HOUSE SURGEON (4 posts).

Royal Portsmouth Hospital (254 Beds)

61 medical beds.
HOUSE PHYSICIAN (1 post).
70 surgical beds.
HOUSE SURGEON (1 post).

Queen Alexandra Hospital (515 Beds)

78 medical beds.
145 geriatric beds.
HOUSE PHYSICIAN (3 posts).

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible. L. C. ROGERS, Group Secretary.

Saint Mary's Hospital, Milton-road, Portsmouth.

PORTSMOUTH. ST. JAMES'S HOSPITAL. Group 12, WESSEX REGION. Applications are invited for JUNIOR HOSPITAL MEDICAL OFFICER appointment. The Hospital is approved as a Psychiatric Teaching Hospital, and the post offers excellent experience in the treatment of the neuroses, the psychoneuroses, the maladjusted child, and the problems of delinquency. The Neurological Department of the Hospital is also recognised by the examining bodies, and arrangements are made to enable junior medical staff to fulfil the D.P.M. regulations regarding mental deficiency. Intending candidates may visit the Hospital by appointment with the Physician-Superintendent.

Applications, stating age, experience, qualifications, and the names and addresses of 2 referees, should be sent to the Physician-Superintendent within 14 days of the appearance of this advertisement.

PORT TALBOT GENERAL HOSPITAL, Hospital-road, PORT TALBOT. (85 Beds.) MID GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (general medicine).

Applications, giving full particulars, and the names and addresses of 2 referees, to be addressed to the Group Secretary of the Committee, 8, Wind-street, Neath.

PRESTON ROYAL INFIRMARY. (409 Beds.) Manchester REGIONAL HOSPITAL BOARD. UROLOGICAL REGISTRAR. Specialist department. F.R.C.S. essential. 1 of 2 Registrar posts. Resident or non-resident. Vacant immediately.

Application forms obtainable from Group Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston, Lancs.

PRESTON ROYAL INFIRMARY. (409 Beds.) Manchester REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR. Post vacant immediately. Recognised for F.R.C.S. Accommodation may be available for married doctor.

Application forms obtainable from Group Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston, Lancs.

READING AND DISTRICT ACCIDENT AND ORTHO-PÆDIC SERVICE, BATTLE HOSPITAL. 2 JUNIOR HOUSE SURGEONS required immediately. Pre- or post-registration. General duties in the service team; including casualty. F.R.C.S. recognised.

Applications to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (397 Beds.) Applications are invited from registered and provisionally registered medical practitioners for the post of RESIDENT HOUSE SURGEON, vacant 1st January, 1960, and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. Applications are invited for appointment of SENIOR HOUSE OFFICER in Paediatrics (18 Beds) and General Medicine (24 Beds) at the above Hospital.

Applications, stating age and experience, with copies of 2 testimonials, to be sent to the Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE.

Tredegar Hospital. Surgical Unit of 50 Beds plus 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty and Radiological Departments. Married quarters.

HOUSE SURGEON, 1st February, with opportunity to follow on to House Physician or House Officer (obstetrics) if satisfactory.

Caerphilly and District Hospital (General Hospital, 226 Beds), 6 miles from Cardiff. Married quarters. Vacancies 1st February.

HOUSE SURGEON (2 posts). Recognised for F.R.C.S.

Applications for these pre-registration appointments to the Group Secretary, Central Offices, Caerphilly-road, Ystrad Mynach, Hengoed, Glam.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the appointment of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) in the Department of Pathology of the Rochdale Group of hospitals. The new Department of Pathology was recently opened and is recognised for the Diploma in Pathology. The duties consist wholly of clinical pathology. The post is one of two and involves half-share in the emergency service. Previous pathology experience is not essential.

Apply at once, giving usual particulars and names and addresses of 2 referees, to Group Secretary, Birch Hill Hospital, Rochdale.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (anaesthetics) required late January. The post is recognised for D.A. and offers a variety of experience. Married accommodation available.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE. BIRCH HILL HOSPITAL. House Officer (surgery) required January for busy surgical unit at above Hospital. Post is recognised for F.R.C.S. qualification and offers excellent experience.

Apply Group Secretary, Rochdale and District Hospital Management Committee, Birch Hill Hospital, Rochdale.

ROCHDALE. BIRCH HILL HOSPITAL. 2 House Officers (medicine) required January at above Hospital. Posts offer excellent experience.

Apply Group Secretary, Rochdale and District Hospital Management Committee, Birch Hill Hospital, Rochdale.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (709 Beds.) SENIOR HOUSE OFFICER (resident or non-resident) required immediately for duties in the Casualty Department. Available for Male or Female applicants. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (709 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required mid-January on the staff of the Regional Neurology and Neurosurgery Centre at the above Hospital. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (709 Beds.) SENIOR HOUSE OFFICER required immediately in the Obstetric and Gynæcological Unit consisting of 96 obstetric and 52 gynæcological beds. Post recognised for the D.Obst. R.C.O.G. and M.R.C.O.G.

Applications should be addressed to the Secretary, Romford Group Hospital Management Committee, at the Hospital as soon as possible.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE SURGEON (general surgery) (Male or Female) required from 21st January, 1960. Post is approved for pre-registration purposes and is recognised for F.R.C.S.

Applications, with names of 2 referees, to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (general medicine). (Accommodation may be available for Female.) Vacant now. Not a pre-registration post.

Apply immediately, Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

RUGBY. HOSPITAL OF ST. CROSS. (168 Beds.) **House** SURGEON (general surgery). Vacant 9th January, 1960. Pre-registration. Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

SALFORD, 6. HOPE HOSPITAL. Salford Hospital MANAGEMENT COMMITTEE. 2 RESIDENT SENIOR HOUSE OFFICER ANÆSTHETISTS required. About 3000 operations annually are performed in theatre. 2 Consultant Anæsthetists are available. Hospital is recognised for the D.A. and F.F.A. R.C.S.

Applications, together with names and addresses of 2 referees, should be forwarded to the Hospital Secretary, Hope Hospital, Salford, 6, Lancs, as soon as possible.

SALFORD, 6. HOPE HOSPITAL. Salford Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required for Orthopædic and Casualty Department at the above Hospital.

Applications, with names and addresses of 2 referees, to be sent to the Hospital Secretary, Hope Hospital, Salford, 6, Lancs.

SALFORD ROYAL HOSPITAL. Salford Hospital Management COMMITTEE. SENIOR HOUSE OFFICER required for the Orthopædic and Casualty Departments. Resident. Post is recognised for F.R.C.S. and gives opportunity for emergency surgery. Vacant immediately.

Applications, stating age and qualifications, together with copies of 2 recent testimonials, to be sent to Hospital Secretary, Salford Royal Hospital, Chapel-street, Salford, 3.

SALISBURY GENERAL HOSPITAL. Applications are invited for the combined appointment of RESIDENT SENIOR HOUSE OFFICER in Orthopædic and Plastic Surgery Departments to start 1st February, 1960. Post, which runs 6 months in each specialty, offers wide experience in orthopædic, traumatic, plastic surgery, and burns.

Applications, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, by 9th January.

SALISBURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics (resident). Post vacant 12th January, 1960. The Hospital, which has special units, is recognised for the F.F.A. R.C.S.

Applications, as soon as possible, to the Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Dundee and Angus Area. Geriatrics. Applications are invited for the post of SENIOR REGISTRAR in the Geriatric Service for Dundee and Angus. The post is based at Maryfield Hospital, Dundee, a general teaching hospital of 370 Beds associated with the University of St. Andrews. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, Vernonholme, Riverside-drive, Dundee, with whom applications must be lodged not later than 2nd January, 1960.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Orthopædic Surgery for hospitals in Fife, based on Kirkcaldy General Hospital for 6 months.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 9th January, 1960.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiodiagnosis, Royal Infirmary, Edinburgh.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 9th January, 1960.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment, which will be for 1 year in the first instance, of REGISTRAR in Anæsthetics based at the Western Infirmary, Glasgow.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 16th January, 1960.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of OPHTHALMIC REGISTRAR at the Royal Hospital.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 9th January, 1960, to Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of SENIOR HOUSE OFFICER in Clinical Pathology. Successful candidate may be required to work in any of the units of the United Sheffield Hospitals.

Applications, giving details of age, education, qualifications and career to date, with names of 3 referees, to Superintendent, Royal Infirmary, Sheffield, 6, not later than 9th January, 1960.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of REGISTRAR or SENIOR HOUSE OFFICER in General Medicine at the Royal Infirmary. Grade according to qualifications and experience.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent to the Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1, not later than 9th January, 1960.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS BOARD OF GOVERNORS and SHEFFIELD REGIONAL HOSPITAL BOARD. Reciprocal training scheme for Senior Registrars. Whole-time SENIOR REGISTRAR in E.N.T. Surgery required with initial tenure of appointment at the Royal Infirmary, Leicester (506 Beds). Possession of a higher qualification desirable. Appointment for 1 year in first instance and renewable thereafter annually. Incumbent will be transferred to the teaching hospitals for the second phase of the appointment in accordance with the arrangements under the Reciprocal Training Scheme. Renewal of the appointment and transfer will be subject to satisfactory work and progress.

Further details and forms of application from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 4th January, 1960.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of REGISTRAR in Thoracic Surgery at the Royal Infirmary.

Applications, with names of 3 referees, should be sent to Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1, by 9th January, 1960.

SHEFFIELD REGIONAL HOSPITAL BOARD. Barnsley Chest Service. Whole-time REGISTRAR (chest diseases) required. Single accommodation available at Wathwood Hospital. Duties at the Hospital and Barnsley Clinics under the supervision of the Consultant. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 4th January, 1960, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHREWSBURY. COPTHORNE HOSPITAL. House PHYSICIAN, pre-registration candidates eligible. Acute general medicine only. Vacant 28th January, 1960.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SENIOR HOUSE OFFICER (ophthalmic). Eye Unit, 35 Beds. Post recognised for D.O. Vacant 15th January, 1960.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. House SURGEON. Vacant mid-January. Pre-registration candidates eligible. Recognised for F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised for F.F.A. R.C.S. Registrar also employed. Vacant 19th January, 1960.

Applications and copy testimonials to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (500 Beds.) HOUSE PHYSICIAN, pre-registration candidates eligible. Acute general medicine only. Vacant immediately.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (500 Beds.) Locum HOUSE PHYSICIAN. Pre-registration candidates eligible. Acute general medicine only. Vacant immediately.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Copthorne Hospital, Shrewsbury.

SHREWSBURY. SHELTON MENTAL HOSPITAL. (1000 Beds.) SHREWSBURY HOSPITAL GROUP. JUNIOR HOSPITAL MEDICAL OFFICER. Appointment for 1 year in first instance. Single residential accommodation available. Recognised for D.P.M. Associated outpatient clinics.

Applications to Medical Superintendent.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. House OFFICER (Surgeon) required immediately for 6 months. Pre-registration.

Applications, giving full details, together with names and addresses of 2 referees, should be sent to the Secretary.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. Senior HOUSE OFFICER (orthopædic) required to commence 1st January, 1960.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be sent to the Secretary.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. (Telephone FOOts Cray 3014–16.) Locum SENIOR HOUSE OFFICER (Anæsthetist) required from 28th December, 1959, for 2 weeks.

Applications to Secretary.

SKIPTON (near). GRASSINGTON HOSPITAL. (208 Beds.) Applications are invited for the appointments of JUNIOR HOSPITAL MEDICAL OFFICER and RESIDENT SENIOR HOUSE OFFICER (medical). Experience will be gained in tuberculosis and other diseases of the chest: close association with major chest unit in area. Time and opportunity for study. Accommodation for single applicants (self-contained flat).

Applications, giving age, qualifications, previous appointments, together with copies of recent testimonials, to Medical Superintendent.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Psychiatry at St. Augustine's Hospital, Chartham Down, near Canterbury. Candidates should possess the D.P.M. and have had wide experience in general medicine. The appointment will be for 1 year in the first instance and will include opportunities for gaining further experience in a wide range of psychiatry, including attendance at adult outpatient clinics.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, W.2, not later than 9th January.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Anæsthetics to the Brighton and Lewes Group of hospitals, based on the Royal Sussex County Hospital, Brighton, with duties at other acute general hospitals in the Group. The appointment is recognised as approved service for the F.F.A. R.C.S. examination and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 9th January.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment, for 1 year in the first instance, of a Whole-time REGISTRAR in Orthopædic Surgery to the Bromley Group of hospitals. There are approximately 100 orthopædic beds in the group, accommodating both long- and short-term orthopædic cases, and a good deal of accident surgery.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, 40, Eastbourne-terrace, W.2, not later than 2nd January.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment, for 1 year in the first instance, of a Whole-time REGISTRAR in Psychiatry at Oakwood Hospital, Maidstone, Kent. Previous experience in general medicine is desirable.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 2nd January.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment, for 1 year in the first instance, as Whole-time REGISTRAR in Chest Diseases at Preston Hall Hospital, British Legion Village, Maidstone, Kent. The appointment will be for work in pulmonary tuberculosis and other diseases of the chest and will provide experience with a major surgical unit and also at chest clinics. Candidates must have had good experience in general medicine and in the diagnosis and treatment of pulmonary tuberculosis and chest diseases in adults. Furnished house available.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 40, Eastbourne-terrace, London, W.2, not later than 2nd January.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited from fully registered practitioners for the post of RESIDENT HOUSE PHYSICIAN (House Officer grade). Post vacant 3rd February, 1960. Appointment primarily to Pædiatric Department, with duties in Cardiological and Skin Departments. Post recognised for D.C.H.

Applications, stating age, qualifications and previous experience, with copies of recent testimonials, should reach the Secretary, General Hospital, Prittlewell Chase, Southend-on-Sea, Essex, by 31st December, 1959.

STIRLING AND CLACKMANNAN HOSPITALS. Board OF MANAGEMENT. Applications are invited for the posts of RESIDENT HOUSE SURGEON at Stirling Royal Infirmary for the 6-month period commencing 1st February, 1960. These posts are for general surgery or general surgery and casualty. They are pre- or post-registration posts and are recognised for F.R.C.S.

Applications should be sent to the Group Medical Superintendent, Stirling Royal Infirmary.

STIRLING AND CLACKMANNAN HOSPITALS. Board OF MANAGEMENT. The following vacancy exists for a Resident House Officer from 1st February, 1960:—

Airthrey Castle Maternity Hospital

1 HOUSE SURGEON (obstetrics).

This is a pre-registration post.

Applications should be sent to the Group Medical Superintendent, Stirling Royal Infirmary.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum SURGICAL REGISTRAR, vacant 1st February, 1960, with duties at Stepping Hill Hospital, Stockport Infirmary and Macclesfield Infirmary.

Applications to be made to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. CHERRY TREE HOSPITAL. (96 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Infectious Diseases, vacant 1st February, 1960. The Hospital is associated with Manchester University for the study of infectious diseases and the successful candidate will have ample opportunity for study. A furnished house is available within the Hospital grounds.

Applications, with full particulars, and names of 2 referees, to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (532 Beds.) Applications are invited for the pre-registration post of HOUSE OFFICER (medicine), vacant 10th March, 1960.

Applications, with full particulars, and names of 2 referees, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw heath, Stockport.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Psychiatry. Possession of the D.P.M. or higher medical qualification essential. Preference will be given to an applicant of wide training who requires further training and experience in psychiatry before applying for consultant post. Hospital may be visited by appointment.

Application forms obtainable from and returnable to Secretary, Shenley Hospital Management Committee, by 15th January, 1960.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens ANÆSTHETIC REGISTRAR, resident, required from 9th January, 1960. Post recognised for F.F.A. R.C.S. and D.A.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON, pre-registration, required. Recognised for F.R.C.S.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (815 Beds.) SENIOR HOUSE OFFICER (general surgery) required. Post recognised for F.R.C.S. Good experience in general and genito-urinary surgery. No casualty work. Post vacant 12th January, 1960.

Applications to Hospital Secretary before 7th January, 1960.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (E.N.T.) required. Recognised F.R.C.S. and D.L.O.

Detailed applications, with copy testimonials, to Hospital Secretary, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN (medicine and pædiatrics) required. Recognised pre-registration.

Applications, with copy testimonials, to the Hospital Secretary as soon as possible.

SWANSEA HOSPITAL, Swansea. (412 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER in the E.N.T. Department of the above Hospital. Vacancy mid-January. The Hospital is recognised under the regulations for the F.R.C.S. (E.N.T.) and the D.L.O.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Anæsthetics at the above Hospital. The post is recognised for the F.F.A. R.C.S. and D.A. examinations.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent of the Hospital.

T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics required at Victoria Hospital, Swindon (100 acute surgical beds). Recognised for D.A. and F.F.A. R.C.S. Previous experience not essential. Approved salary and conditions.

Apply Group Secretary, 7, Okus-road, Swindon, Wilts, as soon as possible.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Resident Pre-registration HOUSE SURGEON required for General Surgical Unit of 80 Beds at Victoria Hospital, Swindon. Recognised for F.R.C.S. Married accommodation available.

Full details, giving names of 3 referees, to Secretary, 7, Okus-road, Swindon.

SWINDON. ST. MARGARET'S HOSPITAL, Stratton ST. MARGARET. HOUSE PHYSICIAN (pre-registration) required for a general medical ward of 32 Beds at above Hospital.

Full details, names of 3 referees, to Secretary, Swindon and District Hospital Management Committee, 7, Okus-road, Swindon, Wilts.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIANS required for posts vacant 9th January and 17th February; pre-registration posts.

Applications, stating age, experience and qualifications with dates, and copies of 2 testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required. Preference given to persons seeking pre-registration post.

Applications, stating age, qualifications with dates, and copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. House Officer (general surgery) required. Pre-registration post. Recognised for F.R.C.S. Post vacant 1st February, 1960.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. House OFFICER (E.N.T.) required. Post-registration appointment, recognised for F.R.C.S. and D.L.O. Post vacant now.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (Male or Female) required for full-time resident casualty and orthopædic work. Some ophthalmic work is also undertaken. 2 other Junior Hospital Medical Officers employed. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. HOUSE PHYSICIAN required now for additional post.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton, immediately.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. Locum SENIOR HOUSE OFFICER (general surgery) required for approximately 6 weeks from 28th December, 1959.

Applications to Group Secretary, c/o Musgrove Park Hospital, Taunton.

TILBURY AND RIVERSIDE GENERAL HOSPITAL, ORSETT BRANCH, ORSETT, ESSEX. Applications are invited for the post of Pre-registration HOUSE PHYSICIAN at the above Hospital. The post, which becomes vacant as from 3rd February, 1960, is for 6 months in the first instance.

Applications, together with copies of recent testimonials, should be forwarded to the undersigned.

M. OWEN, Group Secretary,
Thurrock Hospital, Tilbury and South East Essex
Grays, Essex. Hospital Management Committee.

TILBURY AND RIVERSIDE GENERAL HOSPITAL, ORSETT BRANCH, ORSETT, ESSEX. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER to the Casualty and Orthopædic Department of the above Hospital. The post, which is recognised by the Royal College of Surgeons, becomes vacant as from 18th January, 1960, and will be for a period of 6 months in the first instance.

Applications, together with copies of recent testimonials, should be forwarded to the undersigned.

M. OWEN, Group Secretary,
Thurrock Hospital, Tilbury and South East Essex
Grays, Essex. Hospital Management Committee.

TORQUAY. TORBAY HOSPITAL. (194 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required immediately. Pre-registration appointment. General duties and which will include some work in the E.N.T., Ophthalmic, Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting ref. F.955/91), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. (194 general beds.) RESIDENT HOUSE OFFICER (surgical), Male or Female, required mid-January. Post recognised for F.R.C.S. and pre-registration purposes. Complement of 7 Resident House Officers.

Applications, stating qualifications, nationality and age, together with copy testimonials (quoting F.955/84) to Group Secretary, Torbay Hospital, Torquay.

TORQUAY. TORBAY HOSPITAL. (194 general beds.) SENIOR HOUSE OFFICER (medicine) required February, 1960, with responsibility for general medical and infectious diseases beds. Present complement of House Officers 7. Married quarters available.

Applications, stating qualifications, nationality and age, together with copy testimonials (quoting reference F.955/93) to Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. SENIOR HOUSE OFFICER required for the Orthopædic Department. Salary £852 6s. p.a. A charge of £150 p.a. is made for accommodation.

Address written applications, giving full personal particulars, details of experience, and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited for the position of SENIOR HOUSE OFFICER in the Neurological Department, which has a very close liaison with the Neurological Department of the Teaching Hospital. Salary £852 6s. p.a. A charge of £150 p.a. is made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Manor Hospital (340 Beds)
HOUSE SURGEONS (2).

General (Sister Dora) Hospital (181 Beds)
HOUSE SURGEONS (2).

The above hospitals are acute general hospitals situated in a densely populated industrial area and give wide experience in all branches of medicine and surgery. Posts recognised for pre-registration. Hospitals recognised by R.C.S. Opportunities for experience in general surgery, orthopædics, gynæcology, and E.N.T. surgery. Married quarters are being constructed and are expected to become available during the course of this 6-monthly period.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WALLASEY, CHESHIRE. VICTORIA CENTRAL HOSPITAL. (135 Beds.) Applications are invited for the resident appointment of HOUSE SURGEON, vacant immediately, for a period of 6 months. This post is approved as a pre-registration post. The appointment is approved by the Royal College of Surgeons as training post for F.R.C.S. Salary £486 4s.–£600 12s. p.a. according to experience, less £125 p.a. for board, lodging, &c. Terms and conditions of service in accordance with the regulations of the Ministry of Health.

Applications, giving details of age, nationality, qualifications and experience, together with the names of 3 persons for reference, to the Administrative Officer, Victoria Central Hospital, Liscard-road, Wallasey, Cheshire.

WALLASEY. VICTORIA CENTRAL HOSPITAL (SURGICAL UNIT), Liscard-road, WALLASEY, CHESHIRE. Applications are invited for the resident appointments of 2 HOUSE SURGEONS which fall vacant on 1st March, 1960, and will be for a period of 6 months. These posts are approved as pre-registration posts. Both appointments approved by the Royal College of Surgeons as training posts for F.R.C.S. Salary £486 4s.–£600 12s. p.a., according to experience, less £125 p.a. for board, lodging, &c. Terms and conditions of service in accordance with the regulations of the Ministry of Health.

Applications, giving details of age, nationality, qualifications and experience, together with the names of 3 persons for reference, to the Group Secretary, Mill Lane Hospital, Liscard-road, Wallasey, Cheshire.

WALLASEY. VICTORIA CENTRAL HOSPITAL (MEDICAL UNIT), MILL LANE HOSPITAL, WALLASEY, CHESHIRE. Applications are invited for the resident appointments of 2 HOUSE PHYSICIANS which fall vacant on 1st March, 1960, and will be for a period of 6 months. These posts are approved as pre-registration posts. Salary £486 4s.–£600 12s. p.a., according to experience, less £125 p.a. for board, lodging, &c. Terms and conditions of service in accordance with the regulations of the Ministry of Health.

Applications, giving details of age, nationality, qualifications, and experience, together with the names of 3 persons for reference, to the Group Secretary, Mill Lane Hospital, Wallasey, Cheshire.

WARWICK (near). KING EDWARD VII MEMORIAL CHEST HOSPITAL. (Diseases of the Chest. 224 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER, resident. The Hospital is a modern one with a Thoracic Surgical Unit.

Applications, with names and addresses of 3 referees, to Medical Superintendent.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (215 Beds.) Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade), vacant end of December. Modern department employing 4 full-time Casualty Officers, including whole-time Surgeon-in-Charge. Post recognised for F.R.C.S. Resident or non-resident.

Please send applications, with copies of 2 recent testimonials, to the Administrator.

WELLS, SOMERSET. MENDIP HOSPITAL. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital. Salary and conditions of service in accordance with the Whitley Council terms for Hospital Medical Staff. Facilities are available for studying for the D.P.M. A house will be available at a reasonable rent.

Applications, giving particulars, and names and addresses of 2 referees, to be addressed to the Physician-Superintendent, Mendip Hospital, Wells, Somerset.

WELSH REGIONAL HOSPITAL BOARD. Registrar (pædiatrics), Morriston Hospital, Morriston, near Swansea. Resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) Applications are invited from duly qualified medical practitioners for the pre-registration appointment of HOUSE OFFICER (physician), vacant mid-January, 1960. Single residential accommodation available.

Applications stating age, qualifications, together with names and addresses of 2 referees should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee, c/o The Royal Hospital, Weston-super-Mare.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (324 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience under Area orthopædic team. Post vacant now. Appointment for 6 months in first instance.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (324 Beds.) HOUSE OFFICER (anæsthetics) required. The Hospital is recognised for the F.F.A. R.C.S. and D.A. Post vacant 17th February, 1960.

Applications, with copies of 2 testimonials, to the Hospital Secretary.

WOKING. BROOKWOOD HOSPITAL, Knaphill, Woking, SURREY. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at Brookwood Hospital. The Hospital, which is for the treatment of mental and nervous disorders, undertakes all modern methods of treatment and accommodates 1800 patients. Salary and conditions of service are as laid down by the Whitley Medical Committee, Ministry of Health, viz.: £886 12s.–£57 4s.–£1229 16s. p.a., and the National Health superannuation regulations apply. The appointment is resident and a charge of £170 p.a. will be made for full residential emoluments.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be sent to the Physician-Superintendent, Brookwood Hospital, Knaphill, Woking, within 14 days of the appearance of this advertisement.

WOLVERHAMPTON. NEW CROSS HOSPITAL. Senior HOUSE OFFICER required for Geriatric Department. Consultant Geriatrician in post with active inpatient treatment and outpatient clinics. Vacant middle of January.

Applications to the Hospital Secretary.

WOLVERHAMPTON. NEW CROSS HOSPITAL. House SURGEON (general surgery) required. Post recognised for pre-registration and for F.R.C.S. England. Vacant immediately.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. Pre-registration HOUSE OFFICER (general surgery). Vacant early January. Recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. Senior HOUSE OFFICER (orthopædics and fracture). Post offers excellent experience in orthopædics and a very busy fracture clinic. 2 Consultant Surgeons and Senior Hospital Medical Officer in department. Post recognised for F.R.C.S.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. Senior HOUSE SURGEON, E.N.T. Department. Post recognised for the D.L.O. and F.R.C.S. examinations. Vacant 1st December.

Apply, with copies of 2 testimonials, to the Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. Pre-registration HOUSE OFFICER (pædiatrics). Post recognised for D.C.H. Vacant 2nd February, 1960.

Apply, with copies of 2 testimonials, to the Hospital Secretary.

WORCESTER ROYAL INFIRMARY and RONKSWOOD HOSPITAL, WORCESTER. 2 HOUSE SURGEONS (pre-registration or otherwise) required at the Ronkswood Hospital for general surgery posts, 1 of which includes urology. These posts offer wide and varied experience and are recognised for the F.R.C.S. examinations.

Applications to the Hospital Secretary.

WORKSOP. KILTON HOSPITAL. (185 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required 27th February. Appointment for 1 year in first instance. The Kilton Hospital contains the medical division of the Worksop Group, which includes 42 acute medical beds, some 67 geriatric, 15 pædiatric and 4 dermatological beds. There are 2 House Physicians on the establishment.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 4th January, 1960, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. Applications are invited from registered medical practitioners, or pre-registration candidates, for the posts of HOUSE PHYSICIAN and HOUSE SURGEON at this busy acute hospital, vacant 1st February.

Applications, stating age, qualifications, experience, nationality, together with copies of 2 recent testimonials, to Hospital Secretary. A. V. OAKTON, Group Secretary,

Worthing Group Hospital Management Committee.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) WAR MEMORIAL HOSPITAL, WREXHAM. (230 Beds.) Applications are invited for HOUSE PHYSICIAN posts at the above Hospitals, to commence 1st February, 1960. The appointments are recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire, within 14 days of the appearance of this notice.

WREXHAM. MAELOR GENERAL HOSPITAL. Maternity Unit. (65 Beds.) Applications are invited for the post of HOUSE SURGEON (obstetrics and gynæcology) at the above Hospital to commence 1st February, 1960. The Hospital is a Part II Midwifery Training School and deals with normal and abnormal Midwifery.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire, within 14 days of the appearance of this notice.

WREXHAM, NORTH WALES. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the posts of PÆDIATRIC HOUSE PHYSICIANS at the above Hospital. One appointment will fall vacant 1st February, 1960, and the other appointment on 1st April, 1960. These appointments are recognised for the D.C.H. and for pre-registration purposes. The Pædiatric Unit consists of 50 pædiatric beds and a Neonatal Premature Baby Unit.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire, within 14 days of the appearance of this notice.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Orthopædic Department at the above Hospital commencing 1st February, 1960. The post is residential and affords particular facilities for postgraduate study. Successful applicant will be allowed to attend for 2 days a month at the Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, Salop. The Hospital is recognised for the Diploma of F.R.C.S. (England, Edinburgh, and Ireland).

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire, within 14 days of the appearance of this notice.

WREXHAM. WAR MEMORIAL HOSPITAL. (230 Beds.) Applications are invited for HOUSE SURGEON posts at the above Hospital to commence 1st February, 1960. The appointments are recognised for Diploma of F.R.C.S. (England, Edinburgh, and Ireland) and are pre-registration posts. Locums considered.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire, within 14 days of the appearance of this notice.

YORK. COUNTY HOSPITAL, Monkgate, York. Locum Tenens CASUALTY OFFICER (Junior Hospital Medical Officer grade), required at the above Hospital for 3 weeks commencing 18th January, 1960.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1-year approved ROTATING INTERNSHIP and 1- or 2-year approved GENERAL PRACTICE RESIDENCY beginning 1st July, 1960. 234-Bed General Hospital 10 miles from Detroit. Excellent facilities. Hospital approved for Exchange-Visitor programme. Salary: for Interns $200 if single, $250 if married; for Residents $250 if single, $300 if married. Housing rent-free.

Apply Director.

U.S.A. ELIZABETH GENERAL HOSPITAL AND DIS-PENSARY, 925, East Jersey-street, ELIZABETH, 4, NEW JERSEY. 12 approved ROTATING INTERNSHIPS available as of 1st July, 1960, in a 290-Bed modern general hospital. Excellent teaching programme. Board-certified men in all departments. Full maintenance and monthly stipend $300. Married interns without children are provided with an apartment.

Apply W. MALCOLM MACLEOD, Director.

U.S.A. WOONSOCKET HOSPITAL, Woonsocket, Rhode ISLAND, U.S.A. 2-year RESIDENCY in General Practice, 1st July, 1960. A.M.A. approved. $80 week, plus room. Requirements: graduation approved medical school; completed Internship.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as JUNIOR TUTOR/SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at hospitals managed by the Belfast Hospital Management Committee. In the first instance the appointment will be for the period ending 31st July, 1960, and will be made jointly by the Authority and the Queen's University, Belfast. The appointment will involve teaching and other University duties as Junior Tutor in the Department of Midwifery and Gynæcology.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 27, Adelaide-street, Belfast, and which must be returned so as to be received not later than 7th January, 1960.

CANADA. REDDY MEMORIAL HOSPITAL, Westmount, MONTREAL, CANADA. British graduate required as RESIDENT in Medicine from July, 1960. Salary $225 per month, with full board and lodging. Living-out allowance of $50 per month, if married.

Apply Executive Director.

CANADA. ST. JOSEPH'S HOSPITAL, Victoria, B.C., CANADA. INTERNSHIPS available June, 1960. $175–$225 monthly. Excellent opportunity for doctors interested in general practice.

Apply Medical Superintendent.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOS-PITAL. The Board of Management invite applications from Nigerians for the appointments as Pre-registration and Post-registration House Officers in the above teaching hospital, the appointments becoming vacant on 1st April, 1960.

Pre-registration HOUSE OFFICERS must be provisionally registered practitioners and must be prepared to serve in the following departments:—

Medicine, Surgery, Obstetrics, Pædiatrics.

Post-registration HOUSE OFFICERS must be fully registered medical practitioners and must be prepared to serve in the following departments:—

Surgery, Obstetrics, Anæsthetics, Pædiatrics, General Outpatients.

The salaries offered are:

House Officers, pre-registration, £660 p.a.

Post-registration, £1164 p.a.

On satisfactory completion of service a gratuity of £37 10s. will be paid to post-registration House Officers in respect of each completed 3 months' service.

House Officers will, as far as possible, serve in the department of their choice, but the number of vacancies in any department is limited and very often it is not possible to observe individual preferences.

Conditions of service are generally similar to those applying to contract officers in the service of the Federal Government of Nigeria.

Applications should be submitted not later than 11th January, 1960, on the appropriate forms, which will be forwarded, together with additional information, on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office (University College Hospital, Ibadan), 91, Regent-street (Third Floor), London, W.1.

Public Appointments

LONDON COUNTY COUNCIL. Applications invited from registered medical practitioners of Consultant status for appointment as CONSULTANT OTOLOGIST for 70 sessions a year. Duties include supervision, direction and coordination of the Council's special health services for deaf and partially deaf children. Fees £5 5s. a session of 1½–2½ hours plus car mileage allowance.

Further details and application form obtainable from Medical Officer of Health (PH/D.1/2806), County Hall, S.E.1, returnable by 11th January, 1960.

LONDON COUNTY COUNCIL. Applications invited from medical practitioners practising locally under National Health Service for appointment as VISITING MEDICAL OFFICER to Castlebar Home for Old People, 46, Sydenham Hill, S.E.26. Remuneration £40 a year plus fees receivable from Executive Council in respect of residents and resident staff who may be taken on National Health Service list.

Particulars and application form from Medical Officer of Health (PH/D.1/2783), County Hall, S.E.1. Closing date 4th January.

BIRMINGHAM. CITY OF BIRMINGHAM. Public Health Department. Applications are invited from registered medical practitioners for post of ASSISTANT ADMINISTRATIVE MEDICAL OFFICER OF HEALTH (Male or Female). Candidates should hold the Diploma of Public Health. The successful candidate will have an opportunity to gain administrative experience in all branches of the Public Health Service, including maternity and child welfare. Salary scale £1550–£60–£1790 p.a. Commencing salary within the scale will depend upon the medical officer's experience. Pension scheme (including widows and orphans); medical examination. The officer appointed will be required to devote his/her whole time to official duties and the appointment will be subject to 3 months' notice on either side.

Applications, with names of 3 persons to whom reference may be made, to be sent to the Medical Officer of Health, Council House, Birmingham, 3, not later than 2nd January, 1960.

METROPOLITAN POLICE. Vacancies exist for Police SURGEONS at the following Metropolitan Police Stations :—

Barnet, Belvedere, Bexley, Boreham Wood, Brockley, Bushey, Cannon-row, Chelsea, Chiswick, Deptford, Ealing, Enfield-highway, Elstree, Erith, Feltham, Finchley, Forest Gate, Gerald-road, Gray's Inn-road, Harlington, Harrow-road, Harrow, Highbury Vale, Kensington, Lee-road, Rochester-row, Shepherds Bush, Southgate, South Norwood, Tower Bridge, Twickenham, Wembley, West Hampstead, Wood Green.

Further particulars, including terms of service, may be obtained by applying to the Secretary, Room 165, New Scotland Yard, S.W.1.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to H.M. Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
LLANTRISANT ..	GLAMORGAN ..	9TH JANUARY, 1960

MONMOUTHSHIRE COUNTY COUNCIL. The Council invites applications from duly qualified registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER. Possession of the D.P.H. or similar qualifications would be of advantage. The duties will mainly be the medical inspection and treatment of schoolchildren and infant welfare work. The salary will be at the rate of £1150 p.a. rising by annual increments of £60 to £1510 and then by £65 to £1640. The successful candidate will be required to act under the direction of the County Medical Officer, to devote his/her whole time to the work of the County Council, and to reside in such place as the County Council may determine. The post will be subject to the provisions of the Local Government Superannuation Acts and Regulations, and to a satisfactory medical examination.

A schedule of duties to be performed, together with Conditions of Appointment and a form of application, can be obtained from the County Medical Officer, Cambria House, Caerleon, to whom applications, accompanied by copies of not more than 3 testimonials, are to be sent not later than 4th January, 1960.

VERNON LAWRENCE, Clerk of the Council.

County Hall, Newport, Mon.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT EDUCATION COMMITTEE. Applications are invited from registered medical practitioners for the post of ASSISTANT SCHOOL MEDICAL OFFICER. Salary scale £1150–£1640 p.a.

Further particulars and form of application may be obtained from the Chief Education Officer, Education Department, P.O. Box No. 23, Town Hall, Hanley, Stoke-on-Trent. Closing date 17th January, 1960. H. DIBDEN, Chief Education Officer.

DUBLIN. CORPORATION OF DUBLIN. Vacancy for REGISTRAR (surgical), Dublin Regional Sanatorium. Salary within the range £888 10s.–£1101 10s. p.a. inclusive, depending on experience, with an allowance of £106 10s. p.a. for certain higher surgical qualifications. Deduction of £172 5s. p.a. for emoluments provided in kind. Candidates must, since qualifying as medical practitioners, have had at least 3 years' experience, including at least 2 years' satisfactory surgical experience.

Applications, giving age and full particulars of qualifications and experience, should reach the Finance Department, City Hall, Dublin, not later than 5 P.M. on Monday, 4th January, 1960.

GOVERNMENT OF ST. HELENA. Senior Medical OFFICER, Male or Female, urgently required for duty in St. Helena. Candidates must possess qualifications registrable in the United Kingdom, be capable of emergency surgery and be prepared to proceed immediately to the Island, which is in urgent need of his services. Appointment on permanent basis with pension (non-contributory) at the age of 60 or on agreement for 3 years in first instance. A shorter tour might be arranged if preferred. Salary £1800 p.a. plus a variable dispensing allowance (at present £100 p.a.). Officer using his own car on Government service would receive a transport allowance. Income-tax at low local rates. Quarters provided free with heavy furniture on low rental. Free passages for officer, wife, and up to 3 children on appointment. Assisted passages on leaves up to cost of 3 adult fares. Climate mild and very healthy.

Applicants should get in touch with Director of Recruitment, Colonial Office, London, S.W.1 (telephone ABBey 1266, extension 547 or 548), quoting BCD.117/53/01.

INDIA. HIGH COMMISSION OF INDIA. Medical Adviser's Department. All-India Institute of Medical Sciences. Applications are invited from Indian citizens for the following permanent posts in the Institute :—

(1) PROFESSOR of Chest Surgery in the scale of pay of Rs.1300–60–1600–100–1800 plus Rs.400 per mensem as compensatory allowance.

(2) ASSOCIATE PROFESSOR of Preventive and Social Medicine in the scale of pay of Rs.800–40–1000–1000–1050–1050–1100–1100–1150–50–1300 plus Rs.300 per mensem as compensatory allowance.

Compensatory allowance is admissible to those possessing medical qualifications. Upper age-limit 50 years, relaxable in special cases. Private practice in any form is prohibited.

Application forms and other details regarding qualifications, experience, &c., can be obtained from the High Commission of India, Medical Adviser's Department, India House, Aldwych, London, W.C.2, to whom applications should be submitted before 14th January, 1960.

Hospital Services: Non-Medical Appointments

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (859 Beds.) Applications are invited for the appointment of BIOCHEMIST (Principal grade) to the Biochemistry Department of the Laboratory at Dudley Road Hospital. Applicants should be University Graduates with honours in chemistry or biochemistry and must have had considerable experience in Clinical Biochemistry. Salary, &c., as authorised by the Whitley Council.

Applications, giving details of qualifications and experience, with names of 3 referees, to be received by Group Secretary not later than 9th January, 1960.

Miscellaneous

Boots Pure Drug Company Ltd. invites applications from registered medical practitioners for appointment as an Assistant Medical Adviser in their Medical Department. This is not a new post but a replacement for a retiring member of the staff.

In addition to the Head of the department there are 3 qualified medical advisers. The department is responsible for the organisation of clinical trials, the provision of a comprehensive medical service, and also for close cooperation on all medical and scientific matters with the Research Department. The successful candidate will be required to take full part in all these departmental functions.

Applicants should be under 40 years of age and have had several years' clinical experience, preferably both in hospital and general practice. Some knowledge of clinical and laboratory research, and in particular postgraduate experience in pathology and histology, would be an advantage. A higher qualification is not essential.

The appointment is permanent and full-time and the salary will be according to qualifications and experience but will not be less than £1500 p.a. The Company operates a contributory pension scheme.

Applications, stating age, experience, and full particulars of medical experience, should be sent to the Head of the Medical Department, BOOTS PURE DRUG CO. LTD., Station-street, Nottingham, and will be treated with strict confidence.

CANADA. HAMILTON HEALTH ASSOCIATION
GENERAL SURGEON

A General Surgeon is required for The Mountain Sanatorium, Hamilton, Ontario, Canada; a tuberculosis institution, operated by the Hamilton Health Association. Applicants wanted for the Spring of 1960.

Applications may be sent to: Dr. H. T. EWART, Medical Superintendent, Hamilton Health Association, P.O. Box 590, Hamilton, Ontario, Canada.

CANADA. HAMILTON HEALTH ASSOCIATION
RESIDENT PHYSICIANS

Hamilton Health Association, Hamilton, Ontario, Canada, plans to open a new General and Children's Hospital in the Fall of 1960. Physicians and surgeons interested in residency, prior to establishing residence in Canada, might apply to: Dr. H. T. EWART, Medical Superintendent, Hamilton Health Association, P.O. Box 590, Hamilton, Ontario, Canada.

Since a representative is expected to be in Great Britain in the Spring please forward any applications as soon as possible in order to arrange for a personal interview if desired.

An internationally-known British Pharmaceutical Company has a vacancy of a senior nature for a qualified medical practitioner in connection with the development of pharmaceutical products at home and overseas. Experience of clinical medicine both in hospital and general practice is essential. A higher qualification and knowledge of one or more foreign languages would be an advantage. Starting salary would be in accordance with qualifications and experience, and applicants should be under 35 years of age.—Address No. 549, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Assistant Doctor required for Anglican Mission Hospital in Native reserve (157 Beds). Salary £1370 with free quarters; additional children's allowance if required. Post offers good varied experience. It is purely professional. Initial contract for trial period 1 year. Passage free—to be refunded if successful applicant serves less than 3 years.

Write Medical Superintendent, St. Barnabas Mission Hospital, Ntlaza, Umtata, Cape Province, South Africa, and also Dr. V. U. LUTWYCHE, St. Margaret's Hospital, Epping, for further particulars and interview.

Applications are invited for the post of Senior Medical Officer in Kuwait Army under His Highness Shaikh Abdulla Mubarak Al Subah, Commander-in-Chief. Should be ex-British Army Doctor with first-class record and wide experience in military hospitals and their administration. Preference will be given to officers who have had experience in Middle East. Initial contract for 1 year with annual extensions. Free fully furnished and equipped married accommodation and transport. First-class return air fares London–Kuwait for officer and family. Generous salary with suitable increments according to experience. Holidays approximately 40 days annually. There is no income-tax in Kuwait.

Written applications should be addressed to the KUWAIT AGENCY, 40, Devonshire-street, London, W.1, giving details of nationality, age, qualifications and experience, accompanied by 2 testimonials. Interviews will be held in London.

Medical Statistician. In School of Public Health in Eastern United States, to assist in design and evaluation of research projects in problems of chronic illness and medical care. Experience preferred, though recent graduate considered. Salary $7200–$8400.—Please send full details to Address No. 548, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method." 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 153, Victoria-street, S.W.1 (VICtoria 0141), who are specialists.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3. (HAMpstead 5329/0504.)

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